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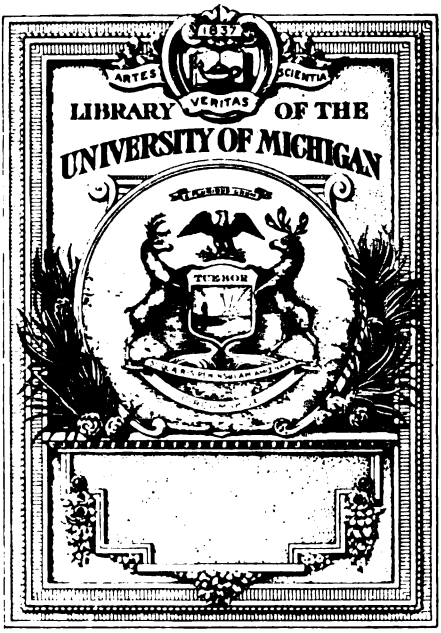
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EARLY
GREEK PHILOSOPHY

67876

BY

JOHN BURNET, M.A.

FELLOW OF MERTON COLLEGE, OXFORD

Περὶ μὲν τῶν ὄντων τὴν ἀλήθειαν ἐσκόπουν, τὰ δ' ὄντα ὑπέλαβον εἶναι τὰ αἰσθητὰ μόνον.—ARISTOTLE

LONDON AND EDINBURGH
ADAM AND CHARLES BLACK
1892

PREFACE.

No apology is needed for the appearance of a work dealing with Early Greek Philosophy. The want of one has long been felt; for there are few branches of philology in which more progress has been made in the last twenty years, and the results of that progress have not yet been made accessible to the English reader. My original intention was simply to report these results; but I soon found that I was obliged to dissent from some of them, and it seemed best to say so distinctly. Very likely I am wrong in most of these cases, but my mistakes may be of use in calling attention to unobserved points. In any case, I hope no one will think I have been wanting in the respect due to the great authority of Zeller, who was the first to recall the history of philosophy from the extravagances into which it had wandered earlier in the century. I am glad to find that all my divergences from his account have only led me a little further in the path that he struck out.

I am very sensible of the imperfect execution of some parts of this work; but the subject has become so large, and the number of authorities whose testimony must be weighed is so great, that it is not easy for any one writer to be equally at home in all parts of the field.

I have consulted the student's convenience by giving references to the seventh edition of Ritter and Preller (ed. Schultess) throughout. The references to Zeller are to the fourth German edition, from which the English translation was made. I have been able to make some use also of the recently published fifth edition (1892), and all references to it are distinguished by the symbol $Z.^5$ I can only wish that it had appeared in time for me to incorporate its results more thoroughly.

I have to thank many friends for advice and suggestions, and, above all, Mr. Harold H. Joachim, Fellow of Merton College, who read most of the work before it went to press.

J. B.

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ABBREVIATIONS.

Arch.	*Archiv für Geschichte der Philosophie.* Berlin, Georg Reimer.
Dox.	*Doxographi Græci. Collegit, recensuit, Prolegomenis Indicibusque instruxit Hermannus Diels.* Berlin 1879.
R. P.	*Historia Philosophiæ Græcæ. Testimonia Auctorum conlegerunt Notisque instruxerunt. H. Ritter et L. Preller. Editio septima, quam curaverunt Fr. Schultess et Ed. Wellmann.* Gotha 1888.
Zeller.	*Die Philosophie der Griechen, dargestellt von Dr. Eduard Zeller. Erster Theil, Vierte Auflage.* Leipzig 1876.

INTRODUCTION.

The cosmological character of early Greek philosophy.

I. It was not until the traditional view of the world and the customary rules of life had broken down, that the Greeks began to feel the needs which philosophies of nature and of conduct seek to satisfy. Nor were those needs felt all at once. The decay of popular morality hardly set in till the traditional view of nature had altogether passed away; and, for this reason, the earliest philosophers busied themselves almost exclusively with speculations about the world around them. In due season, Logic was called into being to meet a fresh want. The pursuit of cosmological inquiry beyond a certain point inevitably brought to light a wide divergence between science and common sense, which was itself a fresh problem demanding some solution, and moreover constrained philosophers to study the means of defending their paradoxes against the prejudices of the unscientific many. Later still, the prevailing interest in logical matters raised the whole question of the origin and validity of knowledge; while, almost at the same time, the breakdown of the traditional morality gave rise to Ethics. The period in the history of Greek thought which precedes the rise of epistemological and ethical speculation has thus a distinctive character of its own, and may fitly be treated apart.[1]

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[1] It will be observed that Demokritos falls outside the period thus limited. The common practice of treating this younger contemporary of

The traditional view of the world.

II. Even in the earliest times of which we have any record, the traditional view of the world is fast passing away, and we are left to gather what manner of thing it was from the stray glimpses we get of it here and there in the older literature, to which it forms a sort of sombre background, and from the many strange myths and stranger rites that lived on, as if to bear witness of it to later times, not only in out-of-the-way parts of Hellas, but even in the "mysteries" of the more cultivated states. So far as we can see, it must have been essentially a thing of shreds and patches, ready to fall in pieces as soon as stirred by the fresh breeze of a larger experience and a more fearless curiosity. The only attempt at an explanation of the world which it could offer was a wild story of the origin of things, only to be matched for puerile cruelty and obscenity among the worst inventions of the lowest races of mankind. In short, the earliest Greek view of nature was nothing more nor less than a form of that world-wide superstition which has its roots deep down in the peculiar constitution of the savage mind.

This is hardly, perhaps, the picture of the earliest state of the Greek intellect with which most of us have been familiar; but the evidence which anthropologists have brought in support of it is, in its cumulative force, overwhelming. Such a story as that of Ouranos, Gaia, and Kronos is plainly, as Mr. Lang has shown in *Custom and Myth*, in all essential features, on precisely the same level of thought as the Maori tale of Papa and Rangi;

Sokrates along with the "pre-Socratic philosophers" has obscured the true course of historical development. Demokritos comes after Protagoras, and his theory is everywhere conditioned by the epistemological problem. See Victor Brochard, *Protagoras et Démocrite* (*Arch.* ii. 368).

while in its details the Greek myth is, if anything, the more savage and disgusting of the two.

The fact is that we allow ourselves to be too easily misled by metaphors about "the childhood of the race," though even these, if properly understood, are suggestive enough. Our ideas of the true state of a child's mind are derived, not so much from observation and the recollection of our own early feelings and thoughts, as from that theory of antenatal existence which has found, perhaps, its highest expression in Wordsworth's *Ode on the Intimations of Immortality.* We transfer these ideas to the race generally, and thus we come to think of the men who made and repeated myths as simple, innocent creatures who were somehow nearer than we are to the beginning of things, and so, perhaps, saw with a clearer vision than ours. A truer view of what a child's thoughts really are will help to put us on the right track. Left to themselves, children are most often tormented by vague terrors of surrounding objects which they fear to confide to any one. Their games are really based upon an animistic theory of things, and they are great believers in luck and in the lot. They are devotees, too, of that "cult of odds and ends" which is fetichism; and the unsightly old dolls which they often cherish more fondly than the choicest products of the toy-shop, remind us forcibly of the ungainly stocks and stones which Pausanias found in the Holy of Holies of many a stately Greek temple. In this sense, then, we may say, if we please, that primitive men were childlike; but we must also bear in mind that the childhood of the race included the maturity of individuals. We must think of the makers of myth as having all the vices and passions of grown men, with only the thoughts and experience of children to keep them in check; and, if we once realise what this means, we shall be at no loss to account for those horrible tales, which were hardly less shocking to the Greeks of a later age than they are to ourselves. But after all, even in the days of Thales, the world was already very old. Those Greeks who first tried to understand nature were not at all in the position of men setting out on a hitherto untrodden path. There was already in the field a tolerably consistent view of the world, though no doubt it was implied and assumed in ritual and myth rather than explicitly present to consciousness. The early thinkers did a far greater thing than merely make a beginning; by turning their backs upon the savage view of things, they renewed their youth, and with it, as it proved, the youth of the world, at a time when the world seemed in its dotage.

The marvel is that they were able to do this so thoroughly as they did. A savage myth might be preserved here and there to the scandal of philosophers; fetiches, totems, and magic rites might lurk in holes and corners with the moles and with the bats, to be unearthed long afterwards by the curious in such matters. But the all-pervading superstition, which we call primitive because we know not how or whence it came, was gone for ever; and we find Herodotos noting with unfeigned surprise the existence among "barbarians" of beliefs and customs which, not so very long ago, his own forefathers had taught and practised as seriously as ever did Libyan or Scyth. Even then, he might have found most of them surviving on the "high places" of Hellas.

Traces of the traditional view in early literature.

III. In Homer we find very few traces of primitive cosmogony, and most of them occur in that strange episode of the Fourteenth Book of the *Iliad*, known as the *Διὸς ἀπάτη*. In it we meet with a considerable number of ideas which are otherwise foreign to Homeric theology, and these are just the exceptions that prove the rule. Even if we cannot follow Gruppe in regarding the whole episode as a parody of a theogonical poem, we must at least admit with Diels that it is full of theogonical reminiscences.[2] Now the ideas which formed the stock-in-trade of early theogonies are not treated in the *Διὸς ἀπάτη* with any degree of seriousness or respect. The poet, we cannot but feel, has no reverence at all for the "holy marriage" of heaven and earth. And yet this was then the central feature of many local religions, just as it is in many a rustic celebration to-day. **1. Homer.**

2. Hesiod. It is not until we come to Hesiod that we find ourselves in a really savage atmosphere, which recalls that of Samoan or Mangaian cosmogony, or of the more unpleasant parts of the Indian *Brâhmanas*. Are we to suppose, then, that the Greeks, after once attaining the comparatively high level of reasonableness which we find in the Homeric poems, were suddenly plunged once more into savagery? Surely not. It is far more likely that in the *Theogony* we have a sort of reactionary manifesto written deliberately for the purpose of saving the old traditions, already threatened by the new spirit. Hesiod says that, as the Muses have already shown their power in fiction, it will be well for them to show that they can sing truth also; and this certainly sounds like a covert attack upon epic poetry. Nor is this difference between Homer and Hesiod hard to understand. We can readily believe that the adventure-loving aristocrats, for whose amusement Homer sang, would care but little for the old folk-tales so dear to the farmer of Askra. With them, a sort of panhellenic polytheism, the Olympian mythology in short, had taken the place of primitive monolatry.[3] But such things as the *Διὸς ἀπάτη* show clearly enough that the epic poet's silence was due rather to reticence than to ignorance, and that he had already the beginnings of the belief that certain stories were "not pious to relate." We infer, then, that at any rate with a certain class of society in Asiatic Hellas, the traditional view of the world was fairly discredited at least as early as the time when the Homeric poems were composed. But in Hesiod we hear for the first time the voice of the common people in close alliance with the local priesthoods of continental Greece, and so we get a more antique tradition.

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[2] See Gruppe, *Griechische Culte und Mythen*, i. pp. 614, 623, and Diels in *Arch.* ii. p. 90.

It would, however, be wrong to see in the *Theogony* a mere recrudescence of the old superstition. Nothing can ever be revived just as it was; for in every revival there is a polemical element which differentiates it completely from the older idea which it vainly seeks to reproduce. Hesiod, after all, could not but be touched by the new spirit which trade and adventure had awakened across the sea. His work is, in truth, but one symptom among others of that very decay of the old ideas which he sought to arrest; for it is an attempt to fuse into a single system all the myths he could come by, and system is necessarily fatal to so wayward a thing as mythology. Hesiod no less than Homer teaches a syncretistic polytheism; the only difference is that in his case this is more directly based upon the legends attached to the local cults, which he thus sought to invest with the lustre of a panhellenic significance. The result is, of course, that the myth becomes primary and the cult secondary, a complete inversion of the primitive relation. Nor is it only by this attempt at system that Hesiod shows himself the child of his time. We also find in the *Theogony* the beginnings of what we must call speculation. Hesiod is not content, as the old tradition doubtless was, to begin with Ouranos and Gaia. We have two new stages in the evolution, namely, Chaos and Eros. The conception of Chaos represents a distinct effort to picture the beginning of things. It is not a formless mixture, like the *tohu-va-vohu* of the first chapter of Genesis, but rather, as its etymology indicates, the yawning gulf or gap where nothing is as yet.[4] We may be pretty sure that this is not primitive. Savage man does not feel called upon to form an idea of the very beginning of all things. The other figure, that of Eros, is introduced in order to explain the impulse to production which gives rise to the whole evolution. The history of philosophy shows what a fruitful idea this was.

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[3] Cf. Robertson Smith, *Religion of the Semites*, i. pp. 39, 40.

3. The cosmogonists.

We have records of great activity in the production of cosmogonies during the whole of the sixth century B.C. We know something of the systems of Epimenides, Pherekydes, and Akousilaos. The earliest Orphic cosmogony goes back to the same period.[5] The feature which is common to all these speculations is the attempt to get behind the Gap, and to put Chronos[6] or Zeus in the first place. It is this which Aristotle has in view when he distinguishes the "theologians" who derive things from Night, from those who were half-theologians, half-philosophers, and put what was best at the beginning.[7] It is obvious, however, that this process might be carried on indefinitely, and that it is the very reverse of scientific, so we have nothing to do with the cosmogonists in the present inquiry, except in so far as they can be shown to have influenced the course of more sober speculation. Indeed, the Orphic theories do not really carry us beyond the Maoris. The strange hymns in which that remarkable people relate the origin of things represent, if anything, a higher level of thought than was attained in Greece before the rise of the Milesian school. The example quoted by Mr. Andrew Lang in *Myth, Ritual and Religion*,[8] contains a very subtle deduction of the Eros which Hesiod simply took for granted.

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[4] Cf. the Orphic *χάσμα πελώριον* and the Scandinavian *Ginunnga-gap*.

[5] This was the view of Lobeck with regard to the "Rhapsodic Theogony" described by Damaskios. It has been revived by Otto Kern (*De Orphei Epimenidis Pherecydis theogoniis*, 1888).

[6] Not, of course, abstract time. See Zeller, p. 72, *n.* 3 (Eng. trans. p. 91, *n.* 2). There was, no doubt, some confusion with Kronos.

General characteristics of early Greek cosmology.

IV. What, then, was the step in advance which placed the Ionian cosmologists once for all above the level of the Maoris? Grote and Zeller make it consist in the substitution of impersonal causes acting according to law for personal causes acting arbitrarily. But the distinction between personal and impersonal was not really much felt in antiquity, and it is surely a mistake to lay such stress on it as most historians have done. It seems rather that the real advance made by the scientific men of Miletos was that they left off telling tales. They gave up the hopeless task of describing what was when as yet there was nothing, and asked instead what all things really are now.

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[7] *Met.* N, 4. 1091*b*, 8.

[8] Vol. ii. p. 28.

Ex nihilo nihil.

The great principle which underlies all the speculations of the early cosmologists, though it is first explicitly laid down by Parmenides, is that *Nothing comes into being out of nothing, and nothing passes away into nothing.* They saw, however, that particular things were always coming into being and passing away again, and from this it followed that the existence of particular things was no true or stable existence. The only things that were real and eternal were the original matter which passed through all these changes and the motion which gave rise to them, to which was soon added that law of proportion or compensation which, despite the continual becoming and passing away of particular things, secured the relative permanence and stability of the various forms of existence that go to make up the world. That these were in fact the leading ideas of the early cosmologists, cannot, of course, be proved till we have given a detailed exposition of their systems; but we can show at once how natural it was for such thoughts to occur to them. The problem of change and decay is always that which first excites the wonder which, as Plato says, is the starting-point of all philosophy. Besides this, there was in the Ionic nature a vein of what we call sentimentalism which led it to brood much upon the instability of things. Even before the time of Thales, we find Mimnermos of Kolophon deeply impressed by the sadness of the passing away of youth; in Anakreon we may perceive something of the same gentle melancholy; and, later still, the lament of Simonides, that the generations of men pass even as the leaves of the forest, touches a chord already struck by the earliest singer of Ionia.[9] Now, so long as men could believe that everything they saw was alive like themselves, the spectacle of the unceasing death and new birth of nature would do no more than tinge their thoughts with a certain sadness, which would find its appropriate expression in such things as the Linos dirges which the Greeks borrowed from their Asiatic neighbours;[10] but, when primitive Animism, which had seen conscious life everywhere, was gone, and polytheistic mythology, which had personified at least the more striking natural phenomena, was going, it must have seemed that there was nowhere any abiding reality. Nowadays, we are accustomed, for good and for ill, to the notion of dead things, obedient, not to inner impulses, but solely to mechanical laws. But this is not the view of the natural man, and we may be sure that, when first it forced itself upon his mind, it must have provoked a strong sense of dissatisfaction. Relief was only to be had from the reflection that as nothing comes from nothing, nothing can pass away into nothing. There must, then, be something which always is, something fundamental which persists throughout all change, and ceases to exist in one form only that it may reappear in another.

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[9] Simonides, fr. 85, 2 Bergk. Cf. *Il.* vi. 146.

Φύσις. So far as I know, no historian of Greek philosophy has clearly laid it down that the word which was used by the early cosmologists to express this idea of a permanent and primary substance was none other than *φύσις*; and that the title *Περὶ φύσεως*, so commonly given to philosophical works in the sixth and fifth centuries B.C., does not mean, "On the Nature of Things,"—a far later use of the word,—but simply, "Concerning the Primary Substance." Both Plato and Aristotle use the term in this sense when they are discussing the earlier philosophy,[11] and the history of the word shows clearly enough what its earliest meaning must have been. In Greek philosophical language, φύσις always means that which is primary, fundamental, and persistent, as opposed to that which is secondary, derivative, and transient; what is "given," as opposed to what is made or becomes. It is that which is there to begin with. It is true that Aristotle also identifies φύσις with the best or most normal condition of a thing; but that is just because, in his philosophy, the goal of any development is held to be prior to the process by which it is reached. Such an idea was, of course, wholly unknown to the pioneers of philosophy. They sought the explanation of the incomplete world we know, not in the end, but in the beginning. It seemed to them that, if only they could strip off all the modifications which Art and Chance and Fate had introduced, they would get at the ultimately real; and so the search after φύσις, first in the world at large, and afterwards in human society, became the chief interest of the age with which we are about to deal.

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[10] The word αἴλινον seems to be the Phœnician אילנו (*ai-lanu*), "Woe is us!" from which the Greeks extracted a mythical personage called Linos. On Adonis-Thammuz, Lityerses, and Osiris, see Frazer, *Golden Bough*, vol. i. p. 278 sqq.

The word ἀρχή, by which the early cosmologists are usually said to have designated the object of their search, is purely Aristotelian. It is perfectly natural that it should be employed in the well-known historical sketch of the First Book of the *Metaphysics;* for Aristotle is there testing the theories of earlier thinkers by his own doctrine of the four causes. But Plato never uses the term in this connection; and, as a matter of fact, it does not once occur in the genuine fragments of the early philosophers, but is altogether confined to the Stoic and Peripatetic handbooks from which most of our knowledge is derived, and these simply repeat Aristotle. Zeller has pointed out in a footnote[12] that it is a complete anachronism to refer the subtle Aristotelian use of the word to the beginnings of speculation. To Anaximander *ἀρχή* could only have meant "beginning," and it was far more than a beginning that the early cosmologists were looking for; it was the *eternal* ground of all things.[13]

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[11] For instance, Plato, *Laws*, 892 B; Aristotle, *Phys.* 193*a*, 9-31; *Met.* 1014*b*, 32.

There is one very important conclusion which follows at once from the account just given of the meaning of *φύσις*, and this is, that the search for the primary substance really was the thing which chiefly interested the Ionian philosophers. Had their main object been, as Teichmüller held it was, the explanation of celestial and meteorological phenomena, they would hardly have entitled their works *Περὶ φύσεως*; we should have had instead *Περὶ κόσμου*, or rather *Περὶ οὐρανοῦ*. And this view we shall find confirmed by a study of the way in which Greek cosmology developed. The growing thought which may be traced through the successive representatives of a given school is always that which concerns the primary substance, while the astronomical and other theories are, in the main, peculiar to the individual thinkers. Teichmüller undoubtedly did good service by his protest against the treatment of these theories as mere isolated curiosities. They form, on the contrary, as will appear, coherent systems which must be looked at as wholes. But it is true none the less that Greek philosophy began, as it ended, in the search for what was lasting and abiding in the flux of things.

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[12] Zeller, p. 203, *n.* 2 (Eng. trans. p. 248, *n.* 2).

[13] See, further, Chap. I. *n.* 57.

"Hylozoism."

V. But how could this give back to nature the life of which it had been robbed by advancing knowledge? Simply by making it possible for that life, which had hitherto been supposed to reside in each particular thing, to be transferred to the one thing of which all others were merely passing forms. The very process of birth, growth, and decay might now be regarded as the exercise of the unceasing activity of the one ultimate reality. The place of Animism was, in fact, taken by what has been called "Hylozoism." The term is, however, most misleading if it suggests to us any analogy with the later systems which commonly go by the name. These were based upon a denial of the separate reality of life and spirit; while, in the days of Thales, and even, as we shall see, in those of Anaxagoras, the distinction between matter and spirit had not been felt, far less formulated in such a way that it could be denied. The uncreated, indestructible, self-moving, living reality of which these early thinkers were in search was body or even matter, if we choose to call it so, but it was not matter in the sense in which matter is contrasted with spirit.

The causes of the decay of the traditional view of the world.

VI. Now that we have sketched in brief outline the traditional theory of the world, and indicated the main characteristics of the view which displaced it, we must turn to the consideration of the causes which led to the downfall of the one and the rise of the other. Foremost among these undoubtedly was the widening of the Greek horizon, effected by the great extension of maritime enterprise which followed the decay of the Phœnician naval supremacy. The scene of the old savage stories had, as a rule, been laid just outside the boundaries of the world known to the men who believed them. Odysseus does not meet with Circe or the Cyclops or the Sirens in the familiar Ægean, but in those western regions which lay beyond the ken of the Greeks at the time the *Odyssey* was composed. Now, however, the West was beginning to be familiar too, and the fancy of the Greek explorers led them to identify the lands which they discovered, with the various spots visited by the hero of the national fairy tale. It was soon ascertained that the monstrous beings in question were no longer to be found there, and the belief grew up that they never had been there at all. So, too, the Milesians had settled colonies all round the Euxine. The colonists went out with Ἀργὼ πᾶσι μέλουσα in their minds; and, at the same time as they changed the name of the Inhospitable to the Hospitable Sea, they localised the indeterminate "far country" of the primitive tale, and made Jason fetch the Golden Fleece from Kolchis. Above all, the Phokaians had explored the Mediterranean as far as the Pillars of Herakles, and the discovery that the "endless paths" of the sea they knew had definite boundaries must, as Grote has said, have moved men's minds in much the same way as did the discovery of America in later days. A single example will illustrate the process which must have been going on continually. The Greeks had an old belief in a certain Atlas, whose name means "he that bears up," and whose business it was to keep Ouranos and Gaia apart after they had been separated by the hatchet or sickle of Kronos. He answered, in fact, to the sky-supporting Ru of the Mangaians.[14] The Greek explorers gave the name to a cloud-capped mountain in Africa — a fanciful identification easily to be matched in the language of sailors in our own day; and, when once this had been done, the old myth was doomed. It was impossible to go on for long believing in a god who was also a mountain, conveniently situated for the trader to steer by, as he sailed to Tartessos in quest of silver.

Alleged "Oriental" influences.

VII. In this connection by far the most important question, however, is that of the nature and extent of the influence exercised by what we call "Oriental" ideas upon the Greek mind. It is a common idea, even now, that the Greeks borrowed their philosophy from Egypt and Babylon, though the Greek writers are one and all quite unconscious of any such debt. Herodotos would not have omitted to mention it had he known anything of it; for it would have confirmed his own view as to the Egyptian origin of Greek religion and culture. Plato, who had a great respect for the Egyptians on other grounds, nevertheless implies that they had no gift for philosophy at all.[15] Aristotle speaks only of the origin of mathematics in Egypt, though, if he had ever heard of an Egyptian philosophy, it would have suited his purpose better to mention that.[16] It was only at a far later date, when Greek and Oriental thought were drawing together, that Egyptian priests and Alexandrian Jews began to vie with one another in discovering the sources of Greek philosophy in their own past. Sanchuniathon and Mochos or Moschos became the order of the day, and even such things as the thoroughly savage myth of Isis and Osiris were first allegorically interpreted according to the ideas of the later Greek philosophy, and then declared to be the original sources of that philosophy. At the Renaissance, this absurd farrago was revived along with everything else, and was made much of by the Florentine Academy and the Cambridge Platonists. Even Cudworth speaks complacently of the ancient "Moschical or Mosaical" philosophy taught by Thales and Pythagoras! Ideas of this sort are always reappearing, even at the present day; and it seems that no refutation of any particular form of them can guarantee us against their reappearance in another. The view that certain esoteric doctrines found their way into Greece through the mysteries ought to have been disposed of once and for all by Lobeck's *Aglaophamus*. The fanciful theories of Röth and Gladisch have been completely overthrown by Zeller, and yet we are still asked to regard the philosophy of Herakleitos "in the light of the idea of the mysteries" and of Egyptian theology. We shall have occasion later on [17] to show how illusory all this is; at present it is desirable to point out once for all that not only is there an entire absence of any evidence that any Oriental nation with which the Greeks ever came in contact had anything which can be called philosophy or science till they learnt it from the Greeks, but there is even abundance of evidence that the traditional view of the world, with all its savage absurdities, maintained its ascendency among them long after it had practically disappeared from Greece.[18] We are justified, then, in laying down that the Greeks did not borrow their philosophy from the Orientals, and that for the very good reason that the Orientals had no philosophy at all to borrow.

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[14] Lang, *Myth, Ritual and Religion*, i. 129.

[15] *Rep.* 435 E.

[16] *Met.* A, 1. 981*b*, 23. Cf. Zeller, p. 37 (Eng. trans. p. 46).

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[17] Chap. III. § 65.

[18] Ed. Meyer's *Geschichte des Alterthums* is a good corrective for exaggerated views of Oriental wisdom.

But it would be quite another thing to say that Greek philosophy originated independently of all Oriental influences. That it might not have done so, we will not undertake to say; but we can hardly doubt that the elementary knowledge of empirical astronomy and mensuration which the Greeks appear to have derived from Egypt and Babylon did act as a powerful stimulus to independent inquiry. It can hardly be an accident that philosophy arose among the Ionians just when communication with these countries was easiest; and it is significant that the very man who was said to have introduced mathematics from Egypt into Greece was also the first of the cosmologists. Now this debt is freely acknowledged by the Greeks. They admit that the beginnings of their mathematics came from Egypt, and it is therefore important for us to ascertain, if possible, what Egyptian mathematics really amounted to. We shall see that even here the Greeks were really original.

Egyptian mathematics.

VIII. There is a papyrus[19] in the Rhind collection at the British Museum which affords us an instructive glimpse of geometry as it was understood on the banks of the Nile. It is true that this papyrus was written in the reign of one of the Hyksos, and therefore considerably before the time of Thales; so it may, perhaps, be taken as an objection to our putting it in evidence, that, for all we know, great progress might have been made in the interval between Aahmes, the writer of the Rhind papyrus, and the visit of Thales to Egypt. There is also, however, an inscription on the temple of Horus at Edfu, describing certain lands granted to the priests by Ptolemy XI., who reigned in the first century B.C.; and this shows conclusively that in Egypt geometry, like everything else, had been stereotyped by the priests at least as early as, and probably much earlier than, the time at which Aahmes wrote. Although the inscription was set up two centuries after the publication of Euclid's *Elements*, it still adheres to the old methods of the Rhind papyrus. And there is another objection to the use we propose to make of that papyrus, which is equally disposed of by the same document. It is sometimes said that the treatise of Aahmes is a mere land-surveyor's handbook, and that it presupposes a more scientific geometry as its basis. The Roman *Agrimensores*, it is pointed out, remained very considerably below the level of the geometry of their time, and Aahmes may have done the same. It might be a sufficient reply to this to say that no one can have a right to assume anything of the sort in the absence of any positive evidence on the subject. But, waiving this, it is probably enough to point out that the consecration of the methods of the papyrus, to which the inscription of Edfu bears witness, is good evidence that these, and these alone, constituted the sacred geometry of the Egyptians. Had the priests themselves possessed anything resembling the Greek geometry, they would have had no scruple in making use of it.

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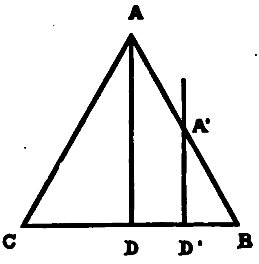
[19] I am mainly indebted for the information which follows to Cantor's *Vorlesungen über Geschichte der Mathematik*, i. 46–63. See also Mr. Gow's *Short History of Greek Mathematics*, §§ 73–80; and Friedlein, *Beitr. zur Gesch. der Math.* ii. [1872].

Having thus established our right to regard the Rhind papyrus as evidence of the state of Egyptian geometry in the time of Thales, let us now examine its methods more closely. We see at once from it that such geometry as existed in Egypt was studied entirely for practical purposes. Herodotos, who tells us that it arose from the necessity of measuring the lands afresh after the inundations,[20] is obviously far nearer the truth than Aristotle, who says that it grew out of the leisure enjoyed by the priestly caste.[21] We may be sure that the essentially Greek idea of the noble use of leisure never dawned upon an Egyptian mind. Aahmes looks at his problems entirely from the land-surveyor's and the pyramid-builder's point of view. He constantly neglects small fractions; and, in calculating the area of triangles, he always assumes that they have one right angle, even when the other data exclude such an assumption altogether. This is the attitude of the artificer, who only requires that an angle should be as nearly a right angle as is necessary for the purposes of his art, and not that of the geometer who is a seeker after truth. The most interesting thing in the papyrus is, however, the collection of exercises in the construction of equal angles. It is obvious that this is a problem which presents itself in the building of pyramids, and the Egyptians hit upon an ingenious method of solving it. This consisted in finding what they called the *seqt* of the angle, that is, the numerical ratio between the *piremus* AB and half the *uchatebt* BC. If we premise that 1 ell = 7 palms, the following example explains itself:—



Uchatebt (BC) = 360 ells.
Piremus (AB) = 250 ells.
∴ *seqt* = $\frac{180}{250}$ ells = $5\frac{1}{25}$ palms.

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[20] ii. 109.

[21] *Met.* A, 1. 981*b*, 23-25.

In other words, for every ell in half the base, there will be $5\frac{1}{25}$ palms in the side. The practical application is obvious. If you have the base of your pyramid marked out, and you know the *seqt*, you have only to measure the number of ells in any part of the base BD′, to erect a wooden post A′D′, and, with a rope knotted at intervals of $5\frac{1}{25}$ palms, you can find the point A′ in the side of the pyramid. This seems to have been the highest point reached by Egyptian geometry; and that the Greeks learnt as much as this from the Egyptians is rendered highly probable by their adoption of the word *piremus* into their language, though in a different sense. It is, however, likely that, from a comparatively early period, they generalised this rule of thumb into a theory of proportional triangles which admitted of an indefinite variety of applications in the measurement of inaccessible distances (§ 5). This generalisation suggested in due time the idea of geometry as a pure science, the type of what our knowledge of the world should be; and this view was expressed in the new name *τὰ μαθήματα*, which soon took its place alongside of *γεωμετρία*, a literal translation from the Egyptian *hunu*. We owe the beginnings of scientific geometry to the Pythagoreans, and it happens that we can easily test the progress made by them and others during the period we are about to study. Thales learnt from the Egyptians all that they could teach him, and, at the end of the period, Demokritos is able to say: "I have listened to many learned men, but not one has yet surpassed me in the construction of figures out of lines accompanied by demonstration—not even the Egyptian 'harpedonapts' as they call them."[22]

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[22] R. P. 145 A. The word ἁρπεδονάπτης is, as Cantor first pointed out, a Greek one, and means simply "cord-fastener." The landscape-gardener

IX. The other source from which the Ionians derived materials for their cosmology is the Babylonian astronomy. Here again, however, we note that what they borrowed was merely empirical, while all their science was original. I take the following statements as to the astronomy of the Babylonians from Professor Sayce's *Hibbert Lectures.*[23] As he attributes (p. 371) a far greater influence upon the development of Greek science to Babylonian cosmology than I can allow, he will probably be regarded as an impartial witness. Our earliest source of information on the subject, he tells us, is the "Observations of Bel," said to have been compiled for King Sargon. These observations are of the most minute and careful kind, but they are utterly devoid of all scientific character. There is no theory of the heavens implied in them; there is nothing but a record of events. Nor are these events recorded for any scientific purpose. In the words of Professor Sayce: "If a war with Elam had followed an eclipse of the sun on a particular day, it was assumed that a recurrence of the eclipse on the same day would be followed by a recurrence of a war with Elam" (p. 398). Nay, so ignorant were the Babylonians of the true nature of the recurrences which they had observed, that they actually expected the weather to follow a cycle of the same kind, and made elaborate records of it accordingly. To say, then, that Anaximander, with his magnificent hypothesis as to the structure of the heavens, owed his astronomy to the observatory at Ur of the Chaldees, is clearly absurd.

Babylonian astronomy.

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laying out a flower-bed is the modern representative of the "harpedonapts," and may fairly be credited with as much knowledge of geometry.

[23] See also the same writer's article "Babylonia" in the *Encyclopædia Britannica.*

We may sum up all this by saying that the Greeks did not borrow either their philosophy or their science from the Oriential peoples. They did, however, get from Egypt certain rules of mensuration which, when generalised, gave birth to geometry; while from Babylonia they learnt that the phenomena of the heavens recur in cycles with the greatest regularity. This piece of knowledge undoubtedly had a great deal to do with the rise of science; for to the Greek it suggested further questions such as the Babylonian did not dream of.

The scientific character of the early Greek cosmology.

X. It is necessary to say something as to the scientific worth of the philosophy we are about to study. We have just seen that the Oriental peoples were, at the time of which we write, considerably richer than the Greeks in accumulated facts, though these facts had certainly not been observed for any scientific purpose, and their possession never suggested a revision of the primitive view of the world. The Greeks, however, saw in them something which could be turned to account, and they were never as a people slow to act on the maxim, *Chacun prend son bien partout où il le trouve.* The most striking monument of this spirit which has come down to us is the work of Herodotos; and the visit of Solon to Crœsus which he describes, however unhistorical it may be, gives a very lively and faithful picture of it. Crœsus, in the episode referred to, tells Solon that he has heard much of "his wisdom and his wanderings," and how, from love of knowledge (*φιλοσοφέων*), he has travelled over much land for the purpose of seeing what was to be seen (*θεωρίης εἵνεκεν*). The words *θεωρίη*, *φιλοσοφίη*, and *ἱστορίη* are, in fact, the catchwords of the time, though they had, we must remember, a very different meaning from that which they were afterwards made to bear at Athens. The idea which underlies them all may, perhaps, be best rendered in English by the word *Curiosity;* and it was just this great gift of curiosity, and the desire to see all the wonderful things—pyramids, inundations, and so forth—that were to be seen, which enabled the Greeks to pick up and turn to their own uses such scraps of knowledge as they could come by among the barbarians. No sooner did a Greek philosopher know half a dozen geometrical propositions, and the fact that the phenomena of the heavens recur in cycles, than he set to work to look for law everywhere in nature, and, with a splendid audacity, almost amounting to ὕβρις, to construct a system of the universe. We may smile, if we please, at the strange medley of childish fancy and true scientific insight which these Titanic efforts display, and sometimes we feel disposed to sympathise with the sages of the day who warned their more daring contemporaries "to think the thoughts befitting man's estate" (*ἀνθρώπινα φρονέειν*). But we shall do well to remember at the same time that even now it is just such hardy anticipations of experience that alone make scientific progress possible, and that nearly every one of the early inquirers whom we are about to study, made some permanent addition to the store of positive knowledge, besides opening up new views of the world in every direction. Nor would it be correct to think of their speculations as having been entirely in the air. The nature of our tradition, which deals almost entirely with *Placita*,[24]—"results," as we should call them,—tends undoubtedly to create this impression; but, for all that, there are not wanting traces of careful and minute investigation of nature. The most striking instance of this occurs, where perhaps we should least expect to find it, in Xenophanes. That philosopher was in every way the least strictly scientific of them all, and yet we happen to know that he supported one of his theories by a careful examination of fossils and petrifactions in such widely scattered localities as Paros, Malta, and Syracuse (§ 49). Anaximander's map (§ 11), however imperfect it may have been, must have been a most laborious undertaking, and we can hardly suppose that he introduced the *gnomon* and *polos* merely that the Spartans might know the time. They served him, of course, to make those observations which led to his discovery of the obliquity of the ecliptic. We shall have to insist a good deal on the absence from early Greek cosmology of anything like mere dogma.

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[24] See *Note on Sources*, B.

The greatest difficulty, however, that stands in the way of a fair appreciation of the really scientific character which belongs to the early Greek cosmology is its dependence on the geocentric hypothesis, and consequent identification of astronomy and meteorology. Strange as it may seem to us, these two branches of science could not be distinguished so long as the earth was supposed to occupy the centre of the *Kosmos* which extended from it to the heavens. And, indeed, the very idea of a *Kosmos* in the Greek sense of the word, or an *Ouranos*, as it was called originally, is foreign to our ways of thinking. We have, therefore, no word in English that exactly represents the idea. It will be convenient to adopt the term *World* for the purpose; but then we must bear in mind that it does not refer solely, or even chiefly, to the earth, but includes everything within the heavens which are generally regarded as spherical. The word *Universe* is far too wide; it means the All; and in all the early cosmologies, except the Eleatic, there was held to be a great deal outside the circle of the heavens, and therefore outside the Kosmos. Nay, there were often supposed to be innumerable Worlds in the Universe.

The science of the sixth century B.C. was occupied mainly with those parts of the world that were "aloft"; and these, of course, include, along with the heavenly bodies, such things as clouds, rainbows, and lightning. It was therefore possible for Xenophanes to identify the heavenly bodies with fiery clouds without going beyond the limits of scientific probability.

Now, in judging all this, we must bear in mind that science inevitably and rightly began with the most obvious hypothesis, and that it was only the thorough working out of this that could show its inadequacy. With the gradual accumulation of data a more comprehensive hypothesis became necessary, no doubt; but the simpler one was quite sufficient to begin with. We have nothing whatever to do with the relation of scientific hypotheses to ultimate reality. They never had, nor have they now, any direct relation to that at all. They are formulæ according to which we group the appearances of the sensible world, and by means of which we are enabled to represent, in a form admitting of calculation, their dependence on one another. And that is why science does not really accumulate, but is entirely transformed by each fresh hypothesis. It is only the data that accumulate; and when we say that a new hypothesis is "truer" than that which preceded it, we mean merely that it enables us to co-ordinate a larger number of these data. Hence, further, the study of the history of science can yield only negative results. We cannot adopt for ourselves hypotheses which were only intended to explain far more limited data than we now possess. On the other hand, we may be saved from the error of setting up as the ultimate truth of things, formulæ which were worked out hundreds of years ago, and cannot possibly explain anything now, for the simple reason that a vast mass of fresh data has since accumulated. And this negative result cannot be regarded as useless; for it sometimes seems as if much of the metaphysical groundwork of modern science were in this very position. The hypotheses of such men as Demokritos are even now given out as the latest generalisation of empirical science.

I do not, of course, mean to attack scientific men for speaking habitually of the content of their hypotheses as if it were the thing in itself. Language is so constructed that this is inevitable; and when they are not writing popular philosophy, scientific men know quite well what a scientific hypothesis really is. I only claim for the early Greek inquirers that we should extend a similar indulgence to them. Their data were vastly less, and so their hypotheses were far less comprehensive and far less available for purposes of calculation. But if they sought for formulæ which would enable them to co-ordinate the data they had, then they were in the true sense scientific men.

And we ought further to remember with gratitude that to the Greeks we owe the conception of an exact science which should take in the whole world as its object. They fancied—absurdly enough, no doubt—that they could work out this science at once. We sometime make the same mistake nowadays; and it can no more rob the Greeks of the honour of having been the first to see the true, though perhaps unattainable, ideal of all science, than it can rob our own scientific men of the honour of having brought this ideal nearer to us than it was to the Greeks. For it is still knowledge of the kind foreseen and attempted by them that we are in search of. It would be foolish to say that, but for the Greeks, we should have no science at all. History has nothing to do with the "might have been." But history does teach us that science has never existed except among those peoples which the Greeks have influenced. Even Indian science came from Hellas in the train of Alexander's army; for any Sanskrit dictionary will show that the scientific terminology of the Hindus is Greek in its origin. Nor do I believe that such philosophical systems as the Nyâya and the Sânkhyâ would ever have arisen apart from Greek influences. Of course the mysticism of the Upanishads and of Buddhism were of native growth and profoundly modified philosophy. But they were religious, and not scientific in their origin.

Early philosophy not conceptual.

XI. The attainment of clear views regarding the earliest Greek philosophy has been appreciably retarded by the mistake which Hegel made when he sought for the explanation of its development in the dialectical evolution of certain concepts—Being, Not-being, Becoming, and so forth. For all early Greek thought moved wholly in the region of what Hegel calls the *Vorstellung*, and was not, therefore, philosophy at all in his sense of the word. When an early Greek philosopher speaks of *τὸ ὄν*, he does not mean Being, but Body; *τὸ μὴ ὄν* is empty Space, and not Not-being. There is always before the mind of an Anaximander or a Herakleitos a perfectly clear pictorial idea, his system is thoroughly *anschaulich*. When, therefore, we seek to understand these systems, what we have to do is not to think them by means of rational concepts, but to picture them in our minds by means of images. We do not understand the view we are studying till we have done this, and we ought even to be able to draw a diagram of it on paper.

"Schools" of philosophy.

XII. There is still one point which requires elucidation. It will be seen that all through this volume it is assumed that regular "schools" of philosophy existed from the very beginning. Now it has become almost a commonplace to say that this is an anachronism, and that the tradition which represents the Ionian and other cosmologists as standing one to another in the relation of master and scholar, is a mere invention of later times. This idea seems to be derived from Bacon, who more than once commends the older philosophers for not having formed schools as Plato and Aristotle did. It is difficult, however, to imagine where he can have found anything to justify this contrast. All the tradition is against it, and the whole theory rests upon a mistaken idea of the way in which early civilisation really develops. Diels has brought this point out very clearly.[25] In almost every department of life, he observes, the corporation at first is everything and the individual nothing. Greek medicine originated with the guild of the Asklepiads, epic poetry was developed by the Homeridai, the craft of sculpture was at first the secret of the Daidalids. Surely, then, we should expect to find that science too, in those early days, owed its advancement rather to the joint efforts of bodies of men than to the solitary researches of a gifted individual here and there. Further, it is practically certain that the later schools of Greek philosophy were organised as quasi-

[25] See H. Diels, *Ueber die ältesten Philosophenschulen der Griechen*, in *Philosophische Aufsätze Eduard Zeller gewidmet*, Leipz. 1887, pp. 239–260.

religious societies (*θιάσοι*), the members of which led to a certain extent a common life.[26] Xenophon represents even the companions of Sokrates as sharing a common table.[27] Is it likely that associations of this kind grew up at the end of the fifth century B.C.? Lastly, we have one admitted instance of a philosophic guild, that of the Pythagoreans. And it will be found that the hypothesis, if it is to be called by that name, of a regular organisation of scientific activity will alone explain all the facts. The development of doctrine in the hands of Thales, Anaximander, and Anaximenes, for instance, can only be understood as the elaboration of a single idea in a school with a continuous tradition. There is no need, then, to set aside the unanimous voice of antiquity on this subject. We have the authority of Plato for speaking of the "Eleatic band,"—an expression hardly applicable to the two or three men whose names have come down to us,—and he also speaks of "the men of Ephesos," the Herakleiteans, as if they formed a strong body in his own day.[28] The traditional statements as to the relations of mastership and discipleship between early philosophers go back to no less an authority than Theophrastos, and we shall therefore assume fearlessly with Diels, that, besides the head of the school for the time being, there was always a circle of scholars who took part in the researches of the master, and kept up the traditions of the society. Of course we cannot strictly prove it at the present stage of our inquiry, but every chapter of this volume will furnish fresh evidence of this unduly neglected truth.

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[26] Cf. Usener's paper on the Organisation of the Academy and the Peripatos, in *Preuss. Jahrbb.* liii. p. 1 sqq.; and v. Wilamowitz-Möllendorf's *Antigonos von Karystos*, p. 263 sqq.

[27] *Mem.* iii. 14. 1.

[28] *Soph.* 242 D; *Theait.* 179 E.

CHAPTER I.

THE MILESIAN SCHOOL.

Miletos and Lydia.

1. It was at Miletos that the earliest school of scientific cosmology had its home. At the time it arose, the Milesians were in an exceptionally favourable position for literary and scientific as well as for commercial pursuits. They had, indeed, come into conflict more than once with the neighbouring Lydians, whose rulers were now bent upon extending their dominion to the coast; but, towards the end of the seventh century B.C., Thrasyboulos, tyrant of Miletos, had succeeded in making terms with King Alyattes, and an alliance was concluded between them, which not only saved Miletos for the present from a disaster like that which befell Smyrna, but also secured it against molestation for the future. Even half a century later, when Crœsus, resuming his father's forward policy, made war upon and conquered Ephesos, Miletos was still able to maintain the old treaty-relation; and never, strictly speaking, became subject to the Lydians at all.[1] We can hardly doubt that the sense of security which this exceptional position must have fostered had something to do with the rise of scientific inquiry. Material prosperity is necessary as a foundation for the highest intellectual effort; and, at this

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[1] On the history of Miletos during this period, see Grote, chap. xvii.; Holm, chap. xxiii.; Meyer, *Gesch. des Alterthums*, § 487 sqq.

time, Miletos was in possession of all the refinements of life to a degree unknown in continental Hellas.

Nor was it only in this negative way that the Lydian connexion may have favoured the growth of science at Miletos. What would at a later date have been called Hellenism was, it would seem, traditional with the dynasty of the Mermnadai. There may well be some truth in the statement of Herodotos, that all the "sophists" of the time flocked to the court of Sardeis.[2] The tradition which represents Crœsus as what we should call the "patron" of Greek wisdom, was fully developed in the fifth century B.C.; and, however unhistorical its details may be, it must clearly have some sort of foundation in fact. Particularly noteworthy is "the common tale among the Greeks," that Thales accompanied Crœsus on his luckless campaign against Pteria, apparently in the capacity of military engineer. Herodotos, indeed, no doubt quite correctly, disbelieves the story that he diverted the course of the Halys.[3] But he does not attack it on the ground of any antecedent improbability; and it is quite clear that those who reported it found no difficulty in accepting the relation which it presupposes between the philosopher and the king. Nor are other indications wanting that, during this period, the Lydians assimilated Greek culture to a remarkable degree. In the next century, Xanthos, a native of Sardeis, wrote a history of his own country in the Greek tongue; while, even before Thales, Alkman had introduced Lydian music into Hellas by setting it to Greek words. From such facts as these we conclude that it is quite possible the Lydian monarchs really did do something to stimulate the new ardour of scientific inquiry among their Hellenic dependants.

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[2] Herod. i. 29. Some other points may be noted in confirmation of what has been said as to the "Hellenism" of the Mermnadai. Alyattes had two wives, one of whom, the mother of Crœsus, was a Karian; the other was an Ionian, and by her he had a son called by the Greek name Pantaleon (*ib.* 92). The offerings of Gyges were pointed out in the treasury of Kypselos at Delphoi (*ib.* 14), and those of Alyattes were one of the "sights" of the place (*ib.* 25). Crœsus also showed great liberality to Delphoi (*ib.* 50), and to many other Greek shrines (*ib.* 92). He gave most of the pillars for the great temple at Ephesos. The stories of Miltiades (vi. 37) and Alkmeon (*ib.* 125) should also be mentioned in this connexion.

[3] Herod. i. 75. He disbelieves it because he had heard, probably from the Greeks of Sinope, of the great antiquity of the bridge on the royal road between Ankyra and Pteria. Ramsay, *Asia Minor*, p. 29. Xanthos recorded a tradition that it was Thales who induced Crœsus to ascend his pyre when he knew a shower was coming (fr. 19).

It should be added to all this that the Lydian alliance would greatly facilitate intercourse with Babylon and Egypt. With both these countries Crœsus was on friendly terms; and in them were to be found, as we have seen, the empirical data on which a scientific knowledge of the world might be based. It is noteworthy, too, that Amasis of Egypt had the same Hellenic sympathies as Crœsus, and that the Milesians possessed a temple of their own at Naukratis.[4]

I. THALES.

Thales a Semite?

2. There can be no doubt that the founder of the Milesian School, and therefore the first of the cosmologists, was Thales.[5] But all that we can really be said

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[4] Milesians at Naukratis, Herod. ii. 178, where Amasis is said to have been φιλέλλην. He subscribed to the rebuilding of the temple at Delphoi after the great fire (*ib.* 180).

[5] Simplicius, indeed, quotes from Theophrastos the statement that Thales had many predecessors (*Dox.* p. 475, 11). This, however, need not trouble us; for the scholiast on Apollonios Rhodios (ii. 1248) tells us that Theophrastos made Prometheus the first philosopher. In other

to know about his life comes from Herodotos; and even his statements must be received with great caution, for the romance which gathered round the names of the Seven Wise Men was already pretty fully developed when he wrote. He tells us, in the first place, that Thales was of Phœnician descent. Some ancient writers interpreted this to mean that he came of a "Kadmeian" stock which had emigrated in early days from Boiotia; others declared that he was himself a Phœnician by birth.[6] The name of his father, Examyes, which looks as if it were Karian, suggests, however, a more probable explanation. We know that the Greeks did not always distinguish very clearly between Karians and Phœnicians. It is even possible that the Kadmeian settlers may have tried to legitimise their position in Karia by making use of the idea that Phœnicians and Karians were much the same thing, and that, in occupying the Karian towns, they were only resuming possession of their old homes. If we consider, further, that Thales was supposed to have introduced certain rules of navigation from Phœnicia,[7] we shall see how naturally the statement reported by Herodotos would come to be made. At any rate, the Karian name borne by the father of Thales lends no support to the view that he was a Semite; for the Karians were an Aryan people who had been almost completely assimilated by the Milesians. We find upon the monuments Karian and Greek names alternating in the same families; and there is therefore no reason to suppose that Thales

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words, he prefaced his *Opinions* by a rationalistic explanation of certain culture-myths.

[6] Herod. i. 170 (R. P. 8c); D. L. i. 22 (R. P. 8 B).

[7] Kallimachos, ap. D. L. i. 22. Thales is alluded to as a practical inventor in Plato, *Rep.* x. 600 A, no doubt because of his improvements in navigation.

was anything else than an ordinary Milesian citizen, though perhaps with Karian blood in his veins.[8]

The eclipse foretold by Thales.

3. By far the most remarkable statement that Herodotos makes about Thales is that he foretold the eclipse of the sun, which put an end to the war between the Lydians and the Medes.[9] Now, we have every reason to believe that he was quite ignorant of the true cause of eclipses. Anaximander and his immediate successors certainly were so,[10] and it is surely incredible that the right explanation should once have been given and then forgotten so soon. Even supposing, however, that Thales had known the cause of eclipses, no one can believe that such scraps of elementary geometry as he may have picked up in Egypt would ever have enabled him to calculate one from the elements of the moon's path; it is not surprising, then, that many scholars should simply have disbelieved the story altogether.[11] And yet the evidence is far too strong to be rejected offhand. The

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[8] See Diels, *Thales ein Semite?* (*Arch.* ii. 165 sqq.), and Immisch, *Zu Thales Abkunft* (*ib.* 515). The variant Ἐξαμυεύλου for Ἐξαμύου led Schuster (*Act. Soc. Phil. Lips.* iv. 328 sqq.) to suppose that the father of Thales was really called Samuel, and was therefore a Semite. The reading in question, however, arises merely from a corruption, of which Diels has skilfully explained the origin. The name Examyes occurs also in Kolophon (Hermesianax, *Leontion*, fr. 2, 38 Bgk.), and may be compared with other Karian names such as Cheramyes and Panamyes. For proof that Karian was an Aryan language, see Meyer in *Bezz. Beitr.* x. 147; and, for the confusion of Karians and Phœnicians, Athen., *Deipn.* p. 174, where we are told that Karia was called Phoinike by Korinna and Bakchylides.

[9] Herod. i. 74.

[10] For the theories held by Anaximander and Herakleitos, see R. P. 14 C, and §§ 18, 58.

[11] So especially Martin (*Rév. Arch.* ix. p. 170 sqq.), who holds that what Thales really did was to discover the true cause of solar eclipses. This is most improbable (see last note), and the statement of Aetios to that effect (ii. 24. 1) is at best a conjecture like Martin's own. The objections of Martin do not apply to the view given in the text, which is that of Tannery (*Science hellène*, p. 55 sqq.).

testimony of Herodotos to an event which must have happened about a hundred years before his own birth may, no doubt, be deemed insufficient; but that of Xenophanes, authenticated by Herakleitos and Demokritos, is a very different matter, and this is what we have really to deal with.[12] Xenophanes was, in all probability, a disciple of Anaximander, and he may quite well have seen and spoken with Thales. In any case, he must have known scores of people who were able to remember what happened, and he had no conceivable interest in misrepresenting it. The prediction of the eclipse, then, is better attested than any other fact about Thales whatsoever, and the evidence for it is about as strong as for anything that happened in the early part of the sixth century B.C.

Now it is not impossible to predict eclipses without knowing their true cause. It seems, indeed, that the Babylonians actually did so, and this fact is suggestive enough. Moreover, as it happens, we know something of their method of calculation. On the basis of their astronomical observations, they had made out a cycle of 223 lunar months, commonly (though, it seems, erroneously) called the Saros, within which eclipses of the sun and moon recurred at equal intervals of time.[13] It is true that this would not have enabled them to predict eclipses of the sun for a given spot on the earth's surface; for these phenomena are not visible at all places where the sun is above the horizon at the time. We do not occupy a position at the centre of the earth, and what astronomers call the geocentric parallax has to be taken into account. It would only, therefore, be possible to tell by means of the cycle that an eclipse of the sun would be visible somewhere, and that it might be worth while to look out for it. Now, if we may judge from a report by a Chaldæan astronomer which has been preserved, this was just the position of the Babylonians.[14] They watched for eclipses at the proper dates; and, if they did not occur, they announced the fact as a good omen. To explain what we are told about Thales no more than this is required. He simply said there would be an eclipse; and, as good luck would have it, it was visible in Asia Minor, and on a striking occasion.

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[12] D. L. i. 23: *δοκεῖ δὲ κατά τινας πρῶτος ἀστρολογῆσαι καὶ ἡλιακὰς ἐκλείψεις καὶ τροπὰς προειπεῖν, ὥς φησιν Εὔδημος ἐν τῇ περὶ τῶν ἀστρολογουμένων ἱστορίᾳ, ὅθεν αὐτὸν καὶ Ξενοφάνης καὶ Ἡρόδοτος θαυμάζει, μαρτυρεῖ δ' αὐτῷ καὶ Ἡράκλειτος καὶ Δημόκριτος.*

[13] The first to call attention to the Chaldæan cycle in this connexion seems to have been the Rev. George Costard, Fellow of Wadham College. See his *Dissertation on the Use of Astronomy in History* (London 1764), p. 17. According to Assyriologists, the *Sar* was really a period of 3600 years (Sayce, *s.v.* "Babylonia," in *Encycl. Brit.*); still, even if there has been some mistake about the name, there can be no doubt that the cycle in question was known at Babylon.

Date of Thales.

4. The prediction of the eclipse does not, then, throw much light upon the scientific attainments of Thales; but, if we can fix its date, it will give us a point from which to start in trying to determine the time at which he lived. Modern astronomers have calculated that there were two eclipses of the sun visible in Asia Minor about

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[14] See George Smith, *Assyrian Discoveries* [1875], p. 409. The inscription which follows was found at Kouyunjik:—

"To the king my lord, thy servant Abil-Istar.

. . . .

"Concerning the eclipse of the moon of which the king my lord sent to me; in the cities of Akkad, Borsippa, and Nipur, observations they made, and then in the city of Akkad we saw part. . . . The observation was made, and the eclipse took place.

. . . .

"And when for the eclipse of the sun we made an observation, the observation was made and it did not take place. That which I saw with my eyes to the king my lord I send."

the time required; one in 610, the other in 585 B.C.[15] Now several ancient chronologists actually give 585 B.C. as the date of the eclipse,[16] and this is too striking a coincidence to be lightly set aside. The only real objection is that, according to the figures given by Herodotos, Astyages would have been king of the Medes in that year, whereas we are told expressly that the battle was between Alyattes and Cyaxares. Assyriologists, however, assure us that the Median chronology of Herodotos is falsified by the mistaken idea that Cyrus became king of the Medes in the same year as he became king of the Persians. He did not really succeed in dethroning Astyages till 550 B.C., eight years later; and, accordingly, we must put all the dates based on the era of Cyrus' accession eight years forward. The result of this correction is that we save our date by a year. Astyages did not ascend the throne till 584 B.C., and Cyaxares would still be king of the Medes in the year of the battle.[17] We may take it, then, that the eclipse foretold really was that of May 28th (O.S.), 585 B.C.,[18] and we may infer that the scientific activity of Thales dates back at least to that year.

It is interesting, as a confirmation of the date thus fixed, to observe that, according to Demetrios Phalereus, Thales "received the title of sage"—he seems to regard it as a sort of honorary degree—in the archonship of

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[15] Airy in *Phil. Trans.* cxliii. p. 179 sqq.

[16] Eudemos gave the date roughly as Ol. L. Pliny, however (*Hist. Nat.* ii. 12. 53), gives Ol. XLVIII. 4 (585 B.C.); and this agrees with Jerome's *Abr.* 1432.

[17] Meyer, *Gesch. des Alterth.* §§ 413 and 461. This disposes of Tannery's objection to the date 585 B.C.

[18] Or, according to the Gregorian calendar, May 22nd. See the note in *Ueberweg*, p. 33 (Eng. trans.).

Damasias; and that, according to the Marmor Parium, is just the year 585 B.C.[19] It has also been proved by Diels that Apollodoros fixed the "floruit" of Thales in the very same year.[20] It seems to me that all these coincidences can only be explained on the supposition that some trustworthy authority — say Hekataios — actually recorded that the eclipse occurred during the otherwise memorable archonship of Damasias.

Thales as a mathematician.

5. The introduction of Egyptian geometry into Hellas is universally ascribed to Thales. That he did actually visit Egypt is probable, for he had a theory of the inundations of the Nile. In a well-known passage Herodotos gives three explanations of the fact that this alone of all rivers rises in summer and falls in winter.[21] As his custom is in such cases, he does not name the

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[19] Demetrios Phalereus, ap. D. L. i. 22 (R. P. 8 B). For the date of Damasias, see Diels, *Ueber die Berliner Fragmente der* Ἀθηναίων Πολιτεία, p. 11, *n*. 2. It does not seem to me that the *Politeia* itself points to another date, as Mr. Kenyon thinks. On the contrary, as I read the passage (p. 33, K), the date fixed by Dopp (*Quæstiones de Marm. Par.* p. 59) is directly confirmed by it. The years of "Anarchia" are 590 and 586 B.C., and the archonship of Damasias follows immediately after the second of these.

[20] According to our text of D. L. i. 37 (R. P. 8 A), Thales was born in Ol. XXXV. (640–637 B.C.), and died, seventy-eight years old, in Ol. LVIII. (548–545 B.C.). These figures cannot, of course, be reconciled with each other, and we must assume a mistake somewhere. Diels has withdrawn the explanation which he gave in the *Rheinisches Museum*, xxxi. 15 (R. P. 8*a*). He now holds that the year of the *floruit* has been confused with that of the birth of Thales, and, further, that the archon Damasias of 639 B.C. has been confused with his namesake of 585 B.C. We may assume that Apollodoros made Thales die in 547 B.C., the year before the "ruin of Ionia" which he foresaw, and that he fixed his *floruit* in 585 B.C., the year of the eclipse. The regular assumption of Alexandrian chronology is that the ἀκμή falls in the fortieth year, so Thales would be born in 625 B.C. Now 625 to 547 gives just the seventy-eight years required. Sosikrates, on the other hand (ap. D. L. *l.c.*), counting from Ol. XXXV. (the date of Damasias I.) to Ol. LVIII., said, in round numbers, that he died at the age of ninety.

[21] Herod. ii. 20.

authors of those explanations; but the first of them, that which attributes the floods to the Etesian winds, is ascribed to Thales in the *Placita*,[22] and also by many later writers. Diels has shown that all those statements are derived from a treatise, *On the Rise of the Nile*, attributed to Aristotle and known to the Greek commentators, but now extant only in a Latin epitome of the thirteenth century.[23] In this work the names of the authors of the three theories mentioned by Herodotos were given, the first being ascribed to Thales, the second to Euthymenes of Massalia, and the third to Anaxagoras. Where did Aristotle, or whoever wrote the book, get these names? We think naturally once more of Hekataios, whom Herodotos so often reproduces without mentioning his name; and this conjecture is much strengthened when we find that Hekataios actually mentioned the otherwise obscure Euthymenes.[24] We may perhaps conclude, then, that Thales really was in Egypt; and that Hekataios, in describing the Nile, took account, as was only natural, of his distinguished fellow-citizen's views.

It would lead us too far afield to discuss here the nature and extent of the mathematical knowledge brought back by Thales from Egypt, but it seems desirable to point out that most writers who have treated the subject have seriously misunderstood the character of the tradition.[25] In his commentary on the First Book of Euclid, Proclus enumerates, on the authority of Eudemos,[26] certain propositions which he says were known to Thales. One of the theorems with which he credits him is that a triangle is determined by a side and two angles. This he must have known, says Proclus (or rather Eudemos), as otherwise he could not have measured the distances of ships at sea from a watch-tower. Here we see how all these statements arose. Certain remarkable feats in the way of measurement were traditionally ascribed to Thales,[27] and it was assumed that he must have known all the propositions which these imply. But this is quite an illusory method of inference. What Thales brought from Egypt was mensuration and not mathematics; nor have we any ground for supposing that he knew any more about the *rationale* of the rules he followed than did the author of the Rhind papyrus. Perhaps, indeed, he gave those rules a wider application than the Egyptians had done. Still, mathematics, properly so called, did not come into existence at all till some time after Thales.

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[22] Aet. iv. 1. 1 (*Dox.* p. 384).

[23] *Dox.* pp. 226–229. The Latin epitome will be found in Val. Rose's edition of the Aristotelian Fragments.

[24] Hekataios, fr. 278 (Müller, *F. H. G.* vol. i. p. 19).

[25] See Cantor, *Vorlesungen ueber Geschichte der Mathematik*, i. p. 112 sqq.; and Allman, *Greek Geometry from Thales to Euclid*, in *Hermathena*, iii. pp. 164–174.

Thales as a politician.

6. Thales appears once more in the pages of Herodotos some time before the fall of the Lydian empire. He is said to have urged the Ionian Greeks to unite in a federal state with its capital at Teos.[28] We shall have occasion to notice more than once in the sequel that the early schools of philosophy were in the habit of trying to influence the course of political events; and there are many

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[26] Eudemos wrote the first histories of astronomy and mathematics, just as Theophrastos wrote the first history of philosophy; but he could have no trustworthy information as to the earliest period, for no mathematical writings belonging to it had been preserved.

[27] Measurement of the height of pyramids by the length of their shadow, Pliny, *H. N.* xxxvi. 12. 82; and Plutarch, *Sept. Sap. Conv.* 147 A. Thales is said to have *taught* this to the Egyptians. Distance of ships at sea, Proclus, *in Eucl.*, ed. Friedlein, p. 64.

[28] Herod. i. 170 (R. P. 8c).

things, for instance the part played by Hekataios in the Ionian revolt, which point to the conclusion that the scientific men of Miletos took up a very decided position in the stirring times which followed the death of Thales. It is this political action which has gained the founder of the Milesian School his undisputed place among the Seven Wise Men; and it is owing mainly to his position as one of those worthies that the numerous apocryphal anecdotes which were told of him in later days attached themselves to his name.[29]

Uncertain character of the tradition.

7. If Thales ever wrote anything, it soon was lost, and the works which were written in his name did not, as a rule, deceive even the ancients.[30] Aristotle professes to know something about the views of Thales; but he does not pretend to know the way they were arrived at, nor the arguments by which they were supported. He does, indeed, make certain suggestions, which are repeated by the doxographers as statements of fact; but he himself simply gives them for what they are worth.[31] There is another difficulty in connexion with the doxographical tradition. Many a precise looking statement in the *Placita* has no other foundation than the habit of ascribing any doctrine which was, roughly speaking, characteristic of the whole Ionic "Succession" to "Thales and his followers," and so producing the appearance of a definite statement about Thales. But, in spite of all this, we need not doubt that Aristotle was correctly informed with regard to the leading points at least in the cosmology of Thales. We have seen traces of

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[29] The story of Thales falling into a well (Plato, *Theait.* 174 A) is nothing but a fable teaching the uselessness of *σοφία*; the anecdote about the "corner" in oil (Arist. *Pol.* A. 11) was doubtless invented in opposition to it.

[30] See R. P. 8*d*.

[31] R. P. *ib.*

reference to him in Hekataios, and nothing can be more likely than that later writers of the school should have quoted the views of its founder. We may venture, therefore, upon a conjectural restoration of the cosmology of Thales. In this we shall be guided by what we know for certain of the subsequent development of the Milesian School; for we should naturally expect to find its characteristic doctrines at least foreshadowed in the teaching of its earliest representative. But all this must be taken for just what it is worth; speaking strictly, we do not know anything about the views of Thales at all.

Conjectural account of the cosmology of Thales.

8. The statements of Aristotle with regard to the cosmology of Thales may be reduced to three—

(1.) The earth floats on the water.[33]
(2.) Water is the material cause[33] of all things.
(3.) All things are full of gods; and the magnet is alive, for it has the power of moving iron.[34]

The first of these three statements has often been brought into connexion with the Egyptian and Babylonian cosmogonies.[35] Tannery will not allow that Thales did any more than introduce from Egypt the view that the earth floats upon the waters, that our world is a sort

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[32] *De Cœlo*, B, 13. 294*a*, 28 (R. P. 9 B). Later writers added that Thales gave this as an explanation of earthquakes. Cf. Aetios, iii. 15. 1; and Seneca, *Q. N.* iii. 13. This is probably the conjecture of some "Homeric allegorist," who wished to explain the epithets ἐννοσίγαιος and ἐνοσίχθων. Cf. Diels, *Dox.* p. 225.

[33] *Met.* A, 3. 983*b*, 20 (R. P. 9 A). I have said "material cause," because Aristotle has τῆς τοιαύτης ἀρχῆς (983*b*, 19), and that means τῆς ἐν ὕλης εἴδει ἀρχῆς (*ib.* 7).

[34] *De An.* A, 5. 411*a*, 7 (R. P. 10 A); *ib.* 2. 405*a*, 19 (R. P. 10*a*). D. L. i. 24 (R. P. *ib.*) adds amber. It is tantalising that Aristotle does not name the author of the "notes" to which he refers.

[35] For the oldest Egyptian cosmology, see Maspéro, *Histoire Ancienne*, pp. 27–30; and for the Babylonian *Baau*, Sayce, *Encycl. Brit.* (*loc. cit.*) and *Genesis*, i. 2.

of bubble in the primeval liquid mass, and that the heavenly bodies sail across the upper surface of that bubble, the watery firmament, in boats. It would, indeed, be rash to say that Thales was wholly uninfluenced by ideas of this kind. But the Milesian School was, as we shall see more and more, a society with a continuous tradition; Thales was its acknowledged founder, and he could not have been so in any true sense if he had not gone a step farther than this. We must also take into account the second of the three statements given above. It is expressed in Aristotelian terminology, but it would undoubtedly mean that Thales had said water was the fundamental or primary matter, of which all other substances were mere transient forms. It was, we know, just such a primary substance that the Milesian School, as a whole, was seeking, and it is unlikely that the earliest answer to the great question of the day should have been the comparatively subtle one given by Anaximander. We are, perhaps, justified in holding that the greatness of Thales consisted just in this, that he was the first to ask, not what *was* the original form of matter, but what *is* the primary form of matter now; or, more simply still, "What is the world made of?" The answer he gave to this question was: *water*. ✓

Water.

9. Aristotle and Theophrastos, followed by Simplicius and the doxographers, suggest several explanations of this answer. By Aristotle these explanations are given as avowedly conjectural; but, as was pointed out above, they are repeated by later writers as if they were quite certain.[36] The most probable view of them seems to me

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[36] *Met.* A, 3. 983*b*, 22; Aet. i. 3. 1; Simpl. *Phys.* 36 D (R. P. 9 A. C. *e*). The last of the reasons given by Aristotle, namely, that Thales was influenced by early cosmogonical views as to Okeanos and Tethys,

to be that Aristotle simply ascribes to Thales the arguments used at a later date by Hippon of Samos in support of a similar thesis.[37] This would account for their physiological character. The rise of scientific medicine had made biological arguments very popular in the fifth century; but, in the days of Thales, the prevailing interest was not physiological, but what we should call meteorological, and we must therefore try to understand the theory from this point of view.

Nor is it very hard to see how considerations of a purely meteorological kind may have led Thales to adopt the view he did. Of all the things we know, water seems to take the most various shapes. It is familiar to us in a solid, a liquid, and a vaporous form, and so Thales may well have thought that he saw the world-process from water and back to water again going on before his very eyes. The phenomenon of evaporation naturally suggests everywhere that the fire of the heavenly bodies is kept up by the moisture which they draw from the sea. Even at the present day, the country people speak of the appearance of sunbeams as "the sun drawing water." Water comes down again in the rain; but

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stands on a different footing from the rest. It is given merely as the view of "some," and this makes it all the more strange that Brandis (*Gesch. d. Gr. Röm. Phil.* i. p. 111) should have regarded it as the genuine tradition. It is not so strange that most manuals of philosophical history repeat this as if it were quite certain. Who are the "some" to whom Aristotle refers? Krische (*Forsch.* 36, *n.* 1) suggested that some of the "Sophists" were intended; but surely it is more natural to suppose that Aristotle is simply quoting Plato, who makes this point in *Theait.* 181 B, and *Krat.* 402 B. It is true that he is speaking primarily of Herakleitos in those places, but he is also thinking of the older doctrines from which Herakleiteanism was developed. Now these references in Plato are plainly ironical and playful, so the whole theory falls to the ground.

[37] Cf. *De An.* A, 2. 405*b*, 2 (R. P. 173 B), with the passages referred to in the last note.

only, so the early cosmologists thought, to pass in turn into earth. This view seems strange to us, but it may have seemed natural enough to men who were familiar with the river of Egypt which had formed the Delta, and with the torrents of Asia Minor which bring down unusually large alluvial deposits. At the present day the Gulf of Latmos, on which Miletos used to stand, is completely filled up. Lastly, they thought, earth turns once more to water,—an idea derived from the observation of dew, night-mists, and subterranean springs. For these last were not in early times supposed to have anything at all to do with the rain. The "waters under the earth" were regarded as an entirely independent source of moisture.[38]

Animism or Hylozoism?

10. We come now to the third of the Aristotelian statements quoted above. We shall see that the successors of Thales attributed a "plastic life" of its own to matter, and were, in the sense explained in the *Introduction*, "hylozoists." If we may judge from such scanty indications as we have, Thales had not yet reached this stage. The saying that "all things are full of gods," which Aristotle cites as evidence, is a mere apophthegm of the common type, and proves nothing; while the statement that the magnet and amber are alive, implies, if anything, that other things are not.[39] Of one thing, at any rate, we may be sure, namely, that Cicero is making a mere mistake when he says that Thales believed in a

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[38] See Chap. IX. § 146. The view here taken most resembles that of the "Homeric allegorist" Herakleitos (R. P. 9*e*). That, however, is a mere conjecture too, probably of Stoic, as the others are of Peripatetic, origin.

[39] Baümker, *Das Problem der Materie*, p. 10, *n.* 1. With the apophthegm ascribed to Thales in *De An.* A, 5. 411*a*, 7, compare that attributed to Herakleitos in *Part. An.* A, 5. 645*a*, 17.

divine mind which fashioned all things out of water;[40] Aristotle tells us quite distinctly that none of the earliest cosmologists distinguished the material from the efficient cause.[41] He also believed, however, that Thales taught the world had a soul, though he is very careful to mark this as merely his own conjecture.[42] Aetios then states that Thales did, as a matter of fact, teach this doctrine; and he gives it in the stoical phraseology which he found, no doubt, in his immediate source, the *Vetusta Placita.*[43] To the same source is doubtless due the identification of the "world-intellect" with god. This is simply the Stoic doctrine, and has nothing to do with Thales. Now Cicero follows closely the author of the Epicurean treatise on religion found at Herculaneum, or, at any rate, the immediate source of that work. This in turn went back to a Stoic epitome of Theophrastos, which no doubt "accommodated" the view ascribed to Thales by him just as the *Vetusta Placita* did. Cicero goes a step farther. He eliminates the Stoic pantheism, and turns the immanent world-intellect into a Platonic *demiourgos.* We have here an excellent instance of the way in which the Theophrastean tradition gradually degenerated. In this case, nothing is left of it by the time it reaches Cicero.[44]

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[40] N. D. i. 25 (R. P. 10c). Dr. Reid proposes to remove the inaccuracy by reading *deum autem eam* (*et*) *mentem*, etc. But Minucius Felix (*Octav.* 19) already had the reading of our MSS. (See Mayor on Cic. N. D. *loc. cit.*)

[41] *Met.* A, 3. 984*a*, 17 sqq.

[42] *De An. loc. cit.* (R. P. 10 A).

[43] Aet. i. 7. 11 = Stob. *Ekl.* i. 56 (R. P. 10 B).

[44] On all this, see *Note on Sources*, B, §§ 11, 12; Krische, *Forschungen*, p. 34 sqq.; Diels, *Dox.* pp. 125, 128. The Herculanean papyrus is unfortunately defective here; but we know enough of Philodemos' relation to older sources to be pretty sure of what he must have said. It is not likely that he had anticipated Cicero's mistake.

II. ANAXIMANDER.

Life of Anaximander.

11. The next name that has come down to us is that of Anaximander, son of Praxiades. He, too, was a citizen of Miletos, and Theophrastos described him as an "associate" of Thales.[45] We have seen how that expression is to be understood (§ XII.).

According to Apollodoros, Anaximander was sixty-four years old in Ol. LVIII. 2 (546 B.C.); and this is confirmed by Hippolytos, who says that he was born in Ol. XLII. 3 (610 B.C.).[46] We seem to have here something more than a mere combination of the ordinary type; for, according to all the rules of Alexandrian chronology, Anaximander should have "flourished" in 565 B.C., that is, just half-way between Thales and Anaximenes, and this would make him sixty, not sixty-four, in 546. Now Apollodoros appears to have stated expressly that he had met with the work of Anaximander; and his reason for mentioning this must have been that he found there some chronological indication which enabled him to fix its date without having recourse to conjecture. Diels suggests that Anaximader may have given his age at the time of writing as sixty-four, and that the book may have contained some other statement showing it to have been published in 546 B.C.[47] Perhaps, however, this view hardly does justice to the fact that the year given is that of the fall of Sardeis and the subjugation of the Lydian empire by the Persians. It may be a more plausible conjecture that Anaximander, writing some years later, incidentally mentioned what his age had been at the time of that great crisis in the fortunes of the Ionian states; we know from Xenophanes that the question, "How old were you when the Mede appeared?" was considered an interesting one in those days.[48] At all events, we seem to be justified in believing that Anaximander was twenty-five years old when Thales attracted the notice of the Hellenes by his prediction of the eclipse, and that he did not publish his book till at least forty years after. When he died, we do not know.[49]

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[45] R. P. 11*e*. That the words πολίτης καὶ ἑταῖρος, given by Simplicius in his commentary to the *De Cælo* (*Schol. Br.* 514*a*, 26), are the original words of Theophrastos, is proved by the agreement of Cic. *Acad.* ii. 118: *popularis et sodalis*. The two passages represent entirely distinct branches of the Theophrastean tradition. See *Note on Sources*, §§ 7, 12.

[46] D. L. ii. 2 (R. P. 11); Hipp. *Ref.* i. 6.

[47] *Rheinisches Museum*, xxxi. 24.

Like his predecessor, Anaximander distinguished himself by certain practical inventions. Favorinus seems to have credited him with that of the *gnomon*; but this can hardly be correct, for Herodotos tells us that the Greeks got this instrument from Babylon. Perhaps it was Anaximander who first made it known among the Greeks. He was also the first to construct a map, and Strabo tells us that Hekataios made this the basis of his geographical work.[50] It will be noticed that we come

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[48] Xenophanes, fr. 17 (R. P. 79*a*).

[49] It seems to me likely, however, that Apollodoros synchronised his death with the tyranny of Polykrates (532 B.C.), and that D. L. (*loc. cit.*) has confused this with his *floruit*. For other views, see R. P. 11*c*.

[50] Favorinus, ap. D. L. ii. 1; Herod. ii. 109 (R. P. 11 and 11*b*). It seems that the construction of famous gnomons was ascribed traditionally to celebrated philosophers; that at Delos was referred to Pherekydes of Syros. Pliny (*H. N.* ii. 187) ascribed that of Sparta to Anaximenes, and not to Anaximander, as Favorinus does. The *gnomon* was simply an upright upon a flat surface. It was not a sun-dial; but was used for determining the points of the compass, the solstices and the equinoxes. The flat sun-dial was not invented till the third century B.C., by Aristarchos of Samos, and its place was taken in early times

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across Hekataios very often when we follow up the clues given us by what we are told of the Milesian cosmologists. In all probability he was a member of the school; for he certainly seems to have maintained both the scientific and the political traditions of Thales.

Theophrastos on Anaximander's theory of the primary substance.

12. Nearly all we know of Anaximander's system is derived in the last resort from Theophrastos.[51] As to the credibility of what we are told on his authority, it is enough to remark that the original work of Anaximander, which was in the hands even of Apollodoros, must certainly have existed at the time when Theophrastos wrote the *Opinions*. Moreover, he seems once at least to have quoted Anaximander's own words; and we have therefore every reason to believe that he wrote with the book itself open before him. Here are the remains of what he said of Anaximander in the First Book of his great work:—

> Anaximander of Miletos, son of Praxiades, a fellow-citizen and associate of Thales, said that the material cause and first element of things was the Infinite, he being the first to introduce this name for the material cause.[52] He says it is neither water nor any other of what are now called the elements,[53] but a substance different from them which is infinite, from which arise all the heavens and the worlds within them.—*Phys. Op.* fr. 2 (*Dox.* p. 476; R. P. 12).
>
> He says that this is eternal and ageless, and that it encompasses all the worlds.—Hipp. *Ref.* i. 6 (R. P. 13*a*).

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by the *polos*, which was a concave hemisphere. See Tannery, *Science hellène*, p. 82. For the map of Anaximander, see Strabo, *Geog.* i. 1. 11 (R. P. 11*b*).

[51] See the conspectus of extracts from Theophrastos given by Diels, *Dox.* p. 133. Where the words of the original have been preserved by Simplicius, I have given them alone. On the various writers quoted, see the *Note on Sources*, B.

[52] See below, *n.* 57.

[53] Reading νυνί for εἶναι, with Usener, *Analecta Theophrastea*, p. 31.

> And into that from which things take their rise they pass away once more, "as is ordained; for they make reparation and satisfaction to one another[54] for their injustice according to the appointed time," as he says in these somewhat poetical terms. —*Phys. Op.* fr. 2 (R. P. 12).
>
> And besides this, there was an eternal motion, in the course of which was brought about the origin of the worlds.—Hipp. *Ref.* i. 6 (R. P. 13*a*).
>
> He did not ascribe the origin of things to any alteration in matter, but said that the oppositions in the substratum, which was a boundless body,[55] were separated out.—Simpl. *Phys.* p. 150 D (R. P. 14 A).

The primary substance is not one of the "elements."

13. Anaximander taught, then, that there was one eternal, indestructible substance out of which everything arises, and into which everything once more returns; a boundless stock of matter from which the waste of existence is continually being made good. This is only the natural development of the thought we have ventured to ascribe to Thales, and there can be no doubt that Anaximander at least distinctly formulated it. Indeed, we can still follow to some extent the reasoning which led him to do so. Thales had regarded water as the most likely of all the things we know to be that of which all other substances are forms; Anaximander appears to have asked himself how the primary substance could be one of these particular substances. His argument is preserved by Aristotle, who has the following passage in his discussion of the Infinite:—

> Further, there cannot be a single, simple, body which is infinite, either, as some hold, over and above the elements,

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[54] The important word ἀλλήλοις was omitted in the Aldine Simplicius, but Usener (*loc cit.*) restored it from the MSS. It is not against the Boundless that things commit "injustice," but against one another.

[55] The Aldine here had the monstrous word ἀσώματι. Schleiermacher's conjecture, σώματι, is now confirmed by Diels from all the MSS.

which they then derive from it, any more than without this qualification. For there are some who hold that this (*i.e.* a body over and above the elements) is what is infinite, and not air or water, in order that the other things may not be destroyed by their infinity. *They are in opposition one to another,*—air is cold, water moist, and fire hot,—and therefore, *if any one of them were infinite, the rest would have ceased to be by this time.* Accordingly they say that what is infinite is something other than the elements, and that from it the elements arise.—Arist. *Phys.* Γ, 5. 204*b*, 22 (R. P. 12*b*).

It is clear that in this passage Anaximander is contrasted with Thales and with Anaximenes. Nor is there any reason to doubt that the account given of his reasoning is substantially correct, though, of course, the form is Aristotle's own. Anaximander was struck, it would seem, by the opposition and strife between the things which go to make up the world; the warm fire was opposed to the cold air, the dry earth to the liquid sea. These opposites seem to be waging constant warfare one upon the other, and any predominance of one over the other was an "injustice" for which reparation must be made. This, at least, seems a more probable explanation of the quotation about injustice made by Theophrastos, than the commonly accepted view that Anaximander regarded the separate existence of things as itself a wrong. Such an idea would be Indian rather than Greek, and we shall find that "justice" means with Herakleitos the observance of an equal balance between the "elements."[56] But, however that may be, we are probably entitled to infer from the passage just quoted that Anaximander's thoughts ran somewhat as follows. If Thales had been right in saying that water was the fundamental reality, it would not be easy to see how anything else could ever have existed. One side of the opposition, the cold and moist, would have had its own way unchecked, injustice would have prevailed, and the warm and dry would have been driven from the field long ago. We must, then, have something which is not itself one of the warring opposites we know, something more primitive, out of which they arise, and into which they once more pass away. That Anaximander called this something by the name of φύσις, is clear from the doxographers; the current statement that the word ἀρχή in the sense of a "first principle" was introduced by him, is probably due to a mere misunderstanding of what Theophrastos says.[57]

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[56] On the Herakleitean "justice," see below, § 59.

Conflicting views as to the primary substance.

14. So far all is pretty clear; but when we come to ask what is the proper nature of this boundless something, we are met at once by a number of difficulties which have excited a lengthy controversy. The literature of this subject has been steadily growing ever since the days of Schleiermacher, who was the first to raise the question in its present form,[58] and it is therefore

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[57] If the words quoted from Theophrastos by Simplicius, p. 13 D. (R. P. 12), stood by themselves, no one would ever have supposed them to mean that Anaximander called the Boundless ἀρχή. They would naturally be rendered: "having been the first to introduce this name (*i.e.* τὸ ἄπειρον) for the ἀρχή;" but the words of Hippolytos (*Ref.* i. 6. 2), πρῶτος τοὔνομα καλέσας τῆς ἀρχῆς, have led nearly all writers to take the passage in the less obvious sense. We know, however, that Hippolytos is not an independent authority; but rests altogether, in the last resort, upon Theophrastos, and so the natural view to take is that either his immediate source, or he himself, or a copyist, has dropped out τοῦτο before τοὔνομα, just as κομίσας has been corrupted into καλέσας. The other passage from Simplicius compared by Usener (p. 150, 23 D), πρῶτος αὐτὸς ἀρχὴν ὀνομάσας τὸ ὑποκείμενον, does not seem to me to have anything to do with the question. It means simply that Anaximander was the first to name the substratum as the "material cause," which is a different point altogether. This is how Neuhäuser takes the passage (*Anaximander*, p. 7 sqq.); but I cannot agree with him in holding that the *word* ὑποκείμενον is ascribed to the Milesian.

[58] For this literature see R. P. 11*a*.

needful for us to go somewhat into detail on the matter. If the discussion does not yield much in the way of positive results, it will, at any rate, be of use by calling our attention sharply to the fact that certain ideas which are quite familiar to us did not exist at all in those early days.

We find, then, with regard to Anaximander's "Boundless" four conflicting views, all professing to rest on the authority of Aristotle. I hope to show that none of these can be historically accurate. They are as follows:—

(1.) The "Boundless" is a mixture of all things.

(2.) The "Boundless" is the indeterminate matter of Aristotle.

(3.) The "Boundless" is not, indeed, incorporeal like Aristotle's matter, but it is devoid of quality.

(4.) The "Boundless" is something intermediate between the elements, or between two of them.

Let us examine these four views one by one.

(1.) *The Boundless is a Mixture.*—This view has been chiefly maintained in modern times by Ritter, who held that Anaximander's physics were "mechanical," not "dynamical," and that he must therefore be regarded as opening the series of the "later Ionian physicists." If this were true, it would, of course, destroy our hypothesis of a Milesian School altogether; and certainly the passage of the *Metaphysics*[59] on which Ritter mainly relies seems decisive enough. Aristotle is there pointing out how his own theory of matter is foreshadowed in earlier philosophy, and he does so in these words: "And that is what is meant by the One of Anaxagoras—a better name for it than 'All things together'—and the mixture of Empedokles and Anaximander." If the text is right, these words can surely have but one meaning, namely, that Anaximander regarded the primary substance as a mixture in the same sense that Empedokles did. But there are strong reasons, as Lütze has shown, for doubting whether the words of Aristotle have been handed down to us correctly. It would be very strange that practically no other ancient writer should have mentioned the "mixture" of Anaximander if Aristotle had spoken of it in this explicit way. Not only so, but it is almost as strange to find the mixture of Anaxagoras called the One, as to find the One of Anaximander called a mixture. Now, the two names begin with the same letters; and if we follow Lütze in simply making them change places, everything becomes quite intelligible.[60] The passage from Theophrastos, to which Ritter also appeals in support of his theory, only needs to be correctly interpreted to overthrow it altogether,[61] and there is then nothing left for it to rest on but a mistake of St. Augustine's.[62]

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[59] *Met.* Λ, 2. 1069*b*, 18 (R. P. 12*c*).

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[60] Lütze, *Das ἄπειρον Anaximanders*, p. 54. His arguments may be summed up as follows. In this passage Aristotle is reading his own theory of "potential matter" into the systems of Anaximander, Empedokles, Anaxagoras, and Demokritos. But the names of these philosophers have got out of their proper order. For (1) the "One" which is here attributed to Anaxagoras is identified with the "mixture"; whereas the "mixture" is elsewhere described as a "many," and the attribute of unity reserved for Nous (so, *e.g.*, in *Met.* A, 8. 989*a*, 30 sqq.). Further, (2) in *Phys.* A, 4. 187*a*, 20 (R. P. 12*c*), the "One" of Anaximander is expressly contrasted with the "mixture" of Anaxagoras, just as it would be here if we transposed the two names. Lastly, (3) the chronological order usually observed by Aristotle demands the transposition. The words *βέλτιον γὰρ ἢ ὁμοῦ πάντα* we must then regard as a gloss. See, however, Z.⁵ p. 205, *n.* 1.

[61] Ap. Simpl. *Phys.* p. 27 D (R. P. 12*c*). The word ἐκεῖνος undoubtedly refers to Anaxagoras, not to Anaximander, as Ritter supposed.

[62] Augustine, *Civ. Dei*, viii. 2 (*Dox.* 173). He has simply confused Anaxagoras with Anaximander, as is shown by what he goes on to say.

(2.) *The Boundless is "Indeterminate Matter."* — The passage from the *Metaphysics*, when emended, leaves us with an identification of Anaximander's "Boundless" and Aristotle's "indeterminate potential matter." That this is an anachronism we can see at once; and we may say so without any disrespect to the great authority of Aristotle. That philosopher knew very well that he himself was the inventor of the theory in question; even Plato, he held, had not formulated it clearly. But he is always on the outlook for anticipations of his own views in the systems of earlier thinkers, and it is not surprising that he should have seized eagerly on Anaximander's theory as a misunderstood presentiment of one like his own. Theophrastos merely follows Aristotle in this matter, and the doxographers follow him.

(3.) *The Boundless is body without quality.*—Schleiermacher's great contribution to our knowledge of Anaximander was his proof that the Boundless was a body. Since he wrote, this has hardly been questioned. He held also, however, that this boundless, corporeal mass was totally devoid of quality, and therefore imperceptible by the senses; and this is perhaps the view which has found most favour in this country. Like the others, however, it is an anachronism. Quality is a category which belongs to a far later stage of thought than Anaximander's. It is, no doubt, only by an effort that we can realise a state of men's minds to which the distinction between a thing and its qualities was not obvious; but we must make this effort if we wish to understand early Greek philosophy. Anaximander could never have thought of denying quality of the Boundless: he had not even words to do so in. Nor could he have supposed that a thing might exist and yet be imperceptible to the senses. Aristotle tells us over and over again that this supposition was one that never occurred to the early philosophers; and, in refuting the doctrine of a boundless something prior to the elements, he always proceeds on the assumption that it must be both corporeal and sensible.[63]

(4.) *The Boundless is something intermediate between the "elements."*—Aristotle in several places speaks of those who take as their first principle something "over and above" or "beside" the elements. These passages are universally allowed to refer to Anaximander. In other places, again, he speaks of something intermediate or "between" the elements as the material cause.[64] Nearly all the Greek commentators refer this also to Anaximander;[65] but since the time of Schleiermacher, few modern writers have been found to agree with them. The only two with whose writings I am acquainted are Friedrich Lütze and Joseph Neuhäuser, who, in my opinion, have proved between them that all these passages do, after all, refer to no one else.

Schleiermacher and his followers base their arguments mainly upon a passage in the *Physics*, which they take to mean that the upholder of the "intermediate something," whoever he was, derived all other things from it by rarefaction and condensation; whereas Anaximander derived his "opposites" from the One by "separating out." In itself, the passage might, perhaps, bear this meaning well enough; but the Greek commentators did not take it so. The context, too, favours an interpretation which presents no difficulty to our view;[66] so we may set this passage aside if only some positive indication is forthcoming that Aristotle meant the Boundless of Anaximander when he spoke of the "intermediate something." Now, the way this is enumerated along with Water, Air, and Fire irresistibly suggests the way in which Anaximander's name is usually associated with those of Thales, Anaximenes, and Herakleitos. Again, in the passage from the *Physics*, partially quoted above (p. 50), which is referred to Anaximander by Zeller himself, the something "between" the elements is substituted later on for the something "beside" them, as if there were no difference at all.[67] In the *De Generatione* the same two phrases are used as if they were quite interchangeable, and are also identified with "the Boundless;"[68] and this not once only, but twice.[69] If we refuse to refer all these passages to Anaximander, we must assume that Aristotle bestowed great attention on some thinker whose very name has been lost, and who not only agreed with many of Anaximander's views, but also, as is proved by a passage in the *De Cœlo*, made use of some of his most characteristic expressions.[70] Surely it is simpler to assume that Schleiermacher and Zeller have erred from momentary forgetfulness of the kind and degree of historical truth we must expect to find in Aristotle's critical discussions; and that, even if Anaximander himself never said anything about an "intermediate something," it may yet have seemed to Aristotle that this was a correct account to give of what he really meant.

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[63] So *Phys.* Γ, 4. 203*a*, 16; 204*b*, 22 (R. P. 12*b*), and elsewhere.

[64] Aristotle speaks four times of something intermediate between Fire and Air (*Gen. Corr.* B, 1. 328*b*, 35; *ib.* 5. 332*a*, 21; *Phys.* A, 4. 187*a*, 14; *Met.* A, 7. 988*a*, 30). In five places we have something intermediate between Water and Air (*Met.* A, 8. 989*a*, 13; *Gen. Corr.* B, 5. 332*a*, 21; *Phys.* Γ, 4. 203*a*, 18; *ib.* 5. 205*a*, 27; *De Cælo*, Γ, 5. 303*b*, 12). Once (*Phys.* A, 6. 189*b*, 1) we hear of something between Water and Fire.

[65] So Alexander (R. P. 12*b*), Simplicius, Themistios, and Philoponos. The exceptions are Nikolaos of Damascus and Porphyry who follows him. They refer the passages to Diogenes of Apollonia, which is certainly wrong, as the fragments of that philosopher prove. See below, § 156, fr. 6.

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[66] *Phys.* A, 4. 187*a*, 12 (partially quoted R. P. 12*c*). The two τρόποι mentioned are not two "modes of becoming" (viz. "separating out" and "rarefaction and condensation"), but two ways of regarding the All as one. The context shows that this is so, and Philoponos explains it quite correctly (*Schol. Br.* 334*b*, 38). Next, according to Simplicius, Themistios, and Philoponos, these two τρόποι are—(1) the substratum is one of the three elements; (2) it is something intermediate. We should put a stop after φησίν, for the words καὶ ὅσοι δέ introduce a fresh subject, and Simplicius devotes to them a fresh section of his commentary. Viewed in this light, the passage really asserts what it is disposed to disprove.

[67] *Phys.* Γ, 5. 204*b*, 22 sqq. (R. P. 12*b*). Zeller refers τὸ παρὰ τὰ στοιχεῖα in this passage to Anaximander. Now, at the end, the whole is recapitulated as follows (205*a*, 25): καὶ διὰ τοῦτ' οὐθεὶς τὸ ἓν καὶ ἄπειρον πῦρ ἐποίησεν οὐδὲ γῆν τῶν φυσιολόγων, ἀλλ' ἢ ὕδωρ ἢ ἀέρα ἢ τὸ μέσον αὐτῶν.

[68] *Gen. Corr.* B, 1. 328*b*, 31. Here we have, firstly, τι μεταξὺ τούτων σῶμά τι ὂν καὶ χωριστόν; a little farther on, μίαν ὕλην παρὰ τὰ εἰρημένα; and two lines below, the same thing is referred to as τὸ ἄπειρον τοῦτο.

For we cannot regard the question as settled by the expressions of Aristotle. He may have found it convenient to call the Boundless something intermediate between the elements, just as at other times he found it convenient to regard it as indeterminate matter. There was no room in his own system for anything corporeal and sensible prior to the opposites. Body with him is just that which exhibits opposite qualities — hot and cold, moist and dry; so we need not be surprised if, in attempting to fit the Boundless of Anaximander into his own system, he fluctuates between these two views. When he is thinking of it as something prior to the opposites, he naturally regards it as a kindred conception to his own Matter; when its corporeality is prominent in his thought, he can only speak of it as something intermediate between the elements. That Anaximander cannot have said this, however, is proved by the simple consideration that the elements were never heard of before Empedokles, and that no one could possibly have thought of them before Parmenides.[71]

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[69] The second passage is *Gen. Corr.* B, 5. 332*a*, 20: οὐ μὴν οὐδ' ἄλλο τί γε παρὰ ταῦτα, οἷον μέσον τι ἀέρος καὶ ὕδατος ἢ ἀέρος καὶ πυρός, ἀέρος μὲν παχύτερον καὶ πυρός, τῶν δὲ λεπτότερον. Here, of course, the word οἷον has its "explicative" force (Bonitz, *Index*, 502*a*, 7). The conclusion is: ὥστ' οὐκ ἐνδέχεται μονοῦσθαι ἐκεῖνο οὐδέποτε, ὥσπερ φασί τινες τὸ ἄπειρον καὶ τὸ περιέχον.

[70] *De Cœlo*, Γ, 5 (R. P. 12*b*).

We conclude, then, that all four views distort the theory of Anaximander, interpreting it as they all do by the categories of a later age. Yet each has some truth in it. We may admit that the Boundless contains all things without regarding it as a mixture, a view which implies a theory of irreducible elements just as much as the fourth. We may allow that Aristotle was right in regarding it as the precursor of his own Matter, without losing sight of the fact that it was a sensible body. We may allow that, strictly speaking, Anaximander would have had to deny all qualities of it, if such denial had been possible to him. We shall allow, lastly, that when once the notion of elements had arisen, the most accurate description of it was that it was intermediate between them. But we shall not confuse our account of Anaximander by crediting him with conceptions which did not exist at all in his time.

The primary substance is infinite.

15. Anaximander's reason for conceiving the primary substance as boundless was, no doubt, that indicated by Aristotle, namely, "that becoming might not fail."[72] It is not very likely, however, that these words are his own.

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[71] On the conception of "elements," see Chap. V. § 84.

[72] *Phys.* Γ, 8. 208*a*, 8 (R. P. 12*a*). The argument at the beginning of *Phys.* Γ, 4. 203*b*, 7 (R. P. 13), is often ascribed to Anaximander; but it bears the mark of the Eleatic dialectic, and no doubt belongs to Melissos.

The doxographers, indeed, took them so; but we have seen how apt they are to reproduce the mere suggestions of Aristotle as statements of fact. The doctrine of the boundlessness of the primary substance was not in any way peculiar to Anaximander; it was the universal belief till the time of Parmenides. No doubt, however, the way in which Anaximander regarded the world would bring home to him with more than common force the need of a boundless stock of matter. The "opposites" of which the world consists are, we have seen, always at war with one another, and this strife is marked by "unjust" encroachments on either side. To redress the balance, they must be absorbed once more in their common ground; and this would lead in the long run to the destruction of everything but the Boundless itself, were there not an inexhaustible supply of it from which "opposites" might continually be "separated out" afresh. For the Boundless is no abstract conception, but boundless matter or body. Even if Anaximander spoke of "*the* Boundless" as well as of "boundless substance," he did not mean infinity, but simply that which is infinite. As Zeller puts it, following Schleiermacher and Aristotle, "the Boundless" is not subject but predicate; for both Aristotle and Simplicius, who no doubt follows Theophrastos in this as in other things, speak of it distinctly as a *body*.[73]

It will be seen that, throughout the foregoing discussion, we have assumed that Anaximander's word "boundless" refers to spatial infinity. It has been maintained, however, by Teichmüller and Tannery, that its meaning really is "qualitatively indeterminate," and this view seems to be implied in much that has been written on the subject in this country. That we must regard it as an anachronism, follows from what has been said as to quality above; but a few additional proofs will not be amiss. In the first place, there is no evidence that the word ἄπειρον could possibly have suggested this meaning to any one who had not studied Plato's *Philebos*, or, at any rate, the writings of Philolaos, if Philolaos ever wrote at all. Secondly, the primary substance, we are told by Hippolytos in the Theophrastean extract quoted above, was "infinite and contained all the worlds." To interpret the word περιέχειν here as signifying "to contain potentially," is to ignore the meaning it bears everywhere else in the early cosmologists, that, namely, of "encompassing" the heavens. Again, the testimony of Aristotle on the point is quite unequivocal. He tells us that number and "what is outside the heavens" are supposed to be infinite, "because they never fail in our thought;" and if what is outside the heavens is infinite, then body must be infinite, and there must be innumerable worlds.[74] This must refer to Anaximander among others. Above all, Anaximenes, the successor of Anaximander in the Milesian School, retained his doctrine of φύσις ἄπειρος, and yet he said that this was Air, or rather Mist, which cannot be called "qualitatively indeterminate" in any sense of that expression.

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[73] Arist. *Phys.* Γ, 8. 208*a*, 8; Simpl. *Phys.* p. 150 D (R. P. 12*a*, 14 A).

Let us resume the results of our inquiry so far, and try to picture in our minds the world as it was imagined by Anaximander. We have a boundless mass, which is not any one of the opposites we know, stretching out to infinity on every side of the heavens which bound the world we live in. This mass is a body, and out of it our world once emerged by the "separating out" of the

[74] *Phys.* Γ, 4. 203*b*, 23.

opposites, moist and dry, warm and cold. In our world these are at strife, and they encroach upon one another. The warm, for instance, commits injustice in summer, and the cold in winter. So they will all one day be absorbed again in the Boundless, and our world will cease to be.

The opposites "separated out."

16. Not only does the Boundless encompass the world, it also "steers the course of all things." This metaphor does not seem to fit in very well with the general theory of Anaximander; and, if it be true that Thales adopted the Egyptian idea that the heavenly bodies sail across the firmament in boats (§ 8), it would have been much more natural in his mouth. At any rate, we shall find the idea of celestial boats once more in close connexion with the steering power of the primary substance when we come to Herakleitos (§ 58).

The doxographers tell us that it was the "eternal motion" which brought into being "all the heavens and all the worlds within them." It does not seem at all certain, however, that Anaximander himself used the phrase "eternal motion"; it appears rather to be Aristotle's version of what he found stated about the "separating out" of opposites, and to be meant simply to point the contrast with the Eleatics who denied motion altogether.[75] Theophrastos and the doxographers, of course, reproduce Aristotle. Teichmüller, however, identified the "eternal motion" with the diurnal revolution of the heavens, — a view in which he has been followed by Tannery. The Boundless he regarded as a great spherical mass which, by its rotation, produced the earth and the heavenly bodies, thus making Anaximander's cosmology a real anticipation of the nebular hypothesis.[76] The fundamental mistake here, of course, is that the diurnal rotation, which belongs to the world within the heavens, is attributed to the Boundless outside them; and, when we come to discuss the question of the plurality of worlds, it will be obvious how fatal to the theory this consideration is. Meantime we may note some other objections. Teichmüller relies much on a passage from the *De Cælo*, where Aristotle says that all who believe the world to have come into being represent the earth as having been forced to the centre by the circular movement. This, no doubt, applies to Anaximander amongst others, but it is quite irrelevant here; for it has to do only with the formation of the world after it has been once for all separated off from the Boundless.[77] We shall have to remember the passage when we come to this part of the subject; here we have to do with the motion of the Boundless outside the heavens, not of the opposites inside them. In another place Aristotle speaks of the eternal circular motion as an ancestral belief; and, on the ground that Anaximander was an Ionian, Teichmüller would refer this to him; but the parallel passage in the *Metaphysics* shows quite clearly that the reference is simply to the popular religion, of which Aristotle held this to be the forgotten meaning.[78]

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[75] See Neuhäuser, *Anaximander*, p. 282. In *Met.* A, 5. 986*b*, 14, the "eternal motion" appears as a mere inference of Aristotle's; the words *γεννῶντές γε τὸ πᾶν* would otherwise be superfluous.

The "eternal motion," then, is simply Aristotle's paraphrase of the "separating out" or "birth" of opposites which Anaximander had spoken of but had not more precisely defined. It had not occurred to him to explain how the Boundless gave birth to the opposites at all. The first to ask that question was Anaximenes, and he said it was by rarefaction and condensation.

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[76] Teichmüller, *Studien zur Gesch. der Begr.* p. 56 sqq. This view is well criticised by Neuhäuser, *Anaximander*, p. 284 sqq.

[77] *De Cælo*, B, 13. 295*a*, 9. The other passage which Teichmüller quotes is still less to the point. See Neuhäuser, *loc. cit.*

[78] *De Cælo*, B, 1. 284*a*, 2. Cf. *Met.* Λ, 8. 1074*b*, 13.

The innumerable worlds.

17. We are told that Anaximander believed in "innumerable worlds," and it is now usual to regard these worlds as an infinite series succeeding one another in time. This is Zeller's view, and it has not yet been sufficiently reconsidered in the light of the discoveries made since his fourth edition. I propose to show that these worlds must be regarded as co-existent. There are three possible views which may be taken of the statement that Anaximander taught an infinity of worlds. The worlds may all be eternal and co-existent, or they may be, partially at least, co-existent without being eternal, or they may succeed one another in time. All Zeller's arguments are directed against the first of these positions, none of them apply with any force to the second. It may be allowed at once that his disproof of the idea that the worlds are eternal and co-existent is decisive; to suppose that Anaximander regarded this world or any other as eternal, is contrary to all we otherwise know of him, and is in direct contradiction with the Theophrastean tradition, that he was one of those who regarded the world as perishable.[79] We have, then, to decide between the second and the third of the views enumerated above. Zeller expressly allows that there is nothing at all in the second of them which is out of harmony with what we know of Anaximander; but he thinks that all the statements which have come down to us point rather to the third, and dismisses the second as supported by no sufficient evidence. In answer to this I would call attention to the fact that the true character

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[79] Aet. ii. 4. 6; *Dox.* p. 331.

of the evidence has been put in an entirely new light by Diels, though it is right to add that he himself has not drawn from it the conclusion which, as it seems to me, it now most naturally yields.

Zeller admits that Stobaios, Simplicius, and St. Augustine regarded the innumerable worlds as perishable, but, partially at least, co-existent. Let us first consider, then, what is the nature and value of their testimony. Stobaios enumerates Thales, Pythagoras, Empedokles, Ekphantos, Parmenides, Melissos, Herakleitos, Anaxagoras, Plato, Aristotle, and Zeno as believers in one world; Anaximander, Anaximenes, Archelaos, Xenophanes, Diogenes, Leukippos, Demokritos, and Epicurus as upholders of an infinity.[80] Now, there can be no doubt what this means; the innumerable worlds of Demokritos and Epicurus were unquestionably co-existent in space, and Anaximander is here put quite on a level with them. This is fully admitted by Zeller; but he disputes the authority of the passage on the ground that we can have no confidence in a writer who attributes innumerable worlds to Anaximenes, Archelaos, and Xenophanes. I hope to show that, with regard to the first two of these, Stobaios is quite right, and to give a possible explanation of what is said of the last.[81] His second objection to the passage is that the words which occur at the end of the enumeration do not apply at all to Leukippos, Demokritos, and Epicurus. They certainly do not, if we translate them with Zeller, "in every revolution of the cycle;" but a comparison of the parallel passage in the *Placita* shows that they mean simply "on every side,"[82] and there can be no doubt that the phrase "innumerable worlds on every side of this one" quite appropriately brings out what Zeller himself admits to be the general meaning of the passage. But, leaving all this aside, we must observe that, while Zeller was formerly entitled to reject the authority of the passage, we can no longer do so. It is true that the complete list of names is not given in the *Placita;* but it is given word for word by Theodoret, and that is enough to prove that it is taken from Aetios.[83] No doubt, then, it comes from the *Opinions* of Theophrastos; and, if so, it is quite trustworthy.

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[80] Aet. ii. 1. 2, 8; *Dox.* p. 327.

[81] Anaximenes, § 29; Xenophanes, Chap. II. *n.* 99; Archelaos, Chap. IX. § 160.

Let us turn now to Simplicius. In his commentary on Aristotle's *Physics*[84] he has the following:—

> Those who assumed innumerable worlds, *e.g.* Anaximander, Leukippos, Demokritos, and, later on, Epicurus, assumed that they came into being and passed away *ad infinitum*, some always coming into being and others passing away.

This is also clear enough; but Zeller points out that Simplicius elsewhere makes the same statement more doubtfully. The words to which he refers hardly amount to an expression of doubt, however, and in any case they seem to me to refer to something else.[85] The statement of Simplicius is highly trustworthy; for it, too, is probably based upon Theophrastos.

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[82] Stob. has κατὰ πᾶσαν περιαγωγήν, but Plut. has κατὰ πᾶσαν περίστασιν. Neuhäuser correctly renders the words: *in omnes dimensiones* (*Anaximander*, p. 328, *n.* 2).

[83] Theodoret is the only writer who mentions Aetios by name. On the filiation of all these authorities, see the *Note on Sources*, B.

[84] *Schol. Br.* 424*b*, 43 (R. P. 15*b*).

[85] *Schol. Br.* 480*a*, 35. The words ὡς δοκεῖ do not necessarily imply a doubt; and, if anything is doubted at all, it is merely that the theory of innumerable worlds was derived from the doctrine of an infinite primary substance, not the theory itself.

With regard to the passage from St. Augustine, little need be said. Zeller admitted that it favoured the view we are inclined to take, but Diels has shown that it equally supports Zeller's own opinion,[86] so it cannot count one way or the other.

We come, lastly, to a very important statement which Cicero[87] has copied from Philodemos, the author of an Epicurean treatise *On Religion*, found at Herculaneum, or perhaps rather from the source of that work. This testimony, I venture to think, has not yet been correctly interpreted. "Anaximander's opinion was," says Velleius in Cicero, "that there were gods who came into being, rising and passing away at long intervals, and that these were the innumerable worlds." A great many of the difficulties which formerly beset this passage have been removed by the researches of Diels, and the rest in consequence disappear of themselves. The great source of confusion was the statement in the *Placita* that Anaximander taught "the stars of heaven" were gods; but we now know that this is a mere copyist's error, and that the *Placita* had originally not "the stars of heaven," but "the innumerable heavens."[88] This is also what Stobaios has, and we are therefore entitled to refer it to Aetios. Now there is no doubt that, at the time we are dealing with, the word *οὐρανός* was regularly used in the sense of the later *κόσμος*, so here we have a perfect agreement among our authorities. But what are we to make of the statement that these gods arise and pass away "at long intervals"? This seems always to be understood by commentators as referring to intervals of time, but there is nothing whatever to prevent our understanding it rather of space.[89] In that case Cicero would be in perfect agreement with Simplicius; an agreement explained, of course, by the identity of their ultimate source.

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[86] *Civ. Dei*, viii. 2. See *Dox.* p. 174, *n.* 1.

[87] Cic. *N. D.* i. 25 (R. P. 15).

[88] R. P. 15*a*. Eusebios, Cyril, and the pseudo-Galen all used the *Placita*. Eusebios, living at Constantinople, had only inferior MSS., and therefore reads, with our texts, *ἀστέρας οὐρανίους*. But Cyril, at Alexandria, must have read *ἀπείρους οὐρανούς*, for he writes *ἀπείρους κόσμους*, a perfectly correct interpretation. The pseudo-Galen has *ἀπείρους νοῦς*; but that, as Heeren pointed out, is a mere corruption, arising from the contraction *οῡνους*.

Origin of the heavenly bodies.

18. The doxographers have not left us in the dark as to the process by which the different parts of the world arose from the Boundless. The following statement comes ultimately from Theophrastos—

> He says that something[90] capable of begetting hot and cold was separated off from the eternal at the origin of this world. From this arose a sphere of flame which grew round the air encircling the earth, as the bark grows round a tree. When this was broken up and enclosed in certain rings, the sun, moon, and stars came into existence.—Ps.-Plut. *Strom.* fr. 2 (R. P. 14 B).

We see from this that when a portion of the Boundless had been separated off from the rest to form a world, it first of all differentiated itself into the two opposites, hot and cold. The hot appears as a sphere of flame surrounding the cold; the cold, as earth with air surrounding it. We are not told, however, in this extract how the cold came to be differentiated into earth and air; but there is a passage in Aristotle's *Meteorology* which throws a good deal of light on the subject. We read there—

> But those who are wiser in the wisdom of men give an origin for the sea. At first, they say, all the terrestrial region

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[89] It seems natural to suppose that Cicero read διαστήμασι in his authority, and that is almost a technical term for the *intermundia*.

[90] I read τι for τό, as Diels suggests (note, *in loc.*).

was moist; and, as it was dried up by the sun, the portion of it that evaporated produced the winds and the turnings of the sun and moon, while the portion left behind was the sea. So they think the sea is becoming smaller by being dried up, and that at last it will all be dry.—*Meteor.* B. 1. 353*b*, 5.

. . . .

And the same absurdity arises for those who say that the earth and the terrestrial part of the world at first were moist, but that air arose from the heat of the sun, and that the whole world was thus increased, and that this is the cause of winds and the turnings of the heavens.—*Ib.* 2. 355*a*, 21 (R. P. 14*c*).

In his commentary on the passage, Alexander tell us that this was the view of Anaximander and Diogenes; and what he says is amply confirmed by Anaximander's theory of the sea as it is given by the doxographers.[91] We conclude, then, that after the first separation of the hot and the cold, the heat of the sphere of flame turned part of the moist, cold interior of the world into air or mist,—it is all one at this date,—and that the expansion of this mist broke up the sphere of flame itself into rings, something like that of Saturn. Possibly these were suggested to the mind of Anaximander by the appearance of the Milky Way. I give the theory which he adopted to explain the origin of the heavenly bodies from these rings as it has been preserved by Hippolytos, with some supplements from Aetios—

The heavenly bodies are wheels of fire separated off from the fire which encircles the world, and surrounded by air. And they have breathing-holes, certain pipe-like openings through which the heavenly bodies are seen. For this reason, too, when the breathing-holes are stopped, eclipses occur. And the moon appears now to wax and now to wane because of the stopping and opening of the outlets. The circle of the sun is twenty-seven times the size (of the earth, while that) of the moon (is eighteen times as large).[92] The sun is highest of all, and lowest are the wheels of the fixed stars.—Hipp. *Ref.* i. 6 (R. P. 14 C).

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[91] See below, § 19.

Anaximander said the stars were hoop-like compressions of air, full of fire, breathing out flames at a certain point from orifices. The sun was highest of all, after it came the moon, and below these the fixed stars and the planets.—Aetios = Stob. *Ekl.* i. 510 (R. P. 14*b*).

Anaximander said the sun was a ring twenty-eight times the size of the earth, like a cart-wheel with the felloe hollow and full of fire, showing the fire at a certain point, as if through the nozzle of a pair of bellows.—Aetios = *Plac.* ii. 20. 1 (R. P. 14*b*).

Anaximander held that thunder and lightning were caused by the blast. When it is shut up in a thick cloud and bursts forth with violence, then the breakage of the cloud makes the noise, and the rift gives the appearance of a flash by contrast with the darkness of the cloud.—Aet. iii. 3. 1 (*Dox.* p. 367).

Anaximander held that wind was a current of air (*i.e.* mist) which arose when its finest and moistest particles were set in motion or dissolved by the sun.—Aet. iii. 6. 1 (*Dox.* p. 374).

Rain was produced by the moisture drawn up from the earth by the sun.—Hipp. *Ref.* i. 6, 7 (*Dox.* p. 560).

We saw above that the sphere of flame was broken up into rings by the expansion of the air or vapour that its own heat had drawn up from its moist, cold interior. There are three of these rings, that of the sun, that of the moon, and, lastly, nearest to the earth, the circle of the stars. This was, no doubt, identified with the Milky Way. The circle of the sun was twenty-seven times as large as the earth, and that of the moon eighteen times, from which we may perhaps infer, with Tannery, that the circle of the stars was nine times as large. We do not see the whole circle of the rings; for the mist that formed them imprisons the fire, and becomes an outer ring of opaque air or vapour. These outer rings, however, have round openings at a single point, through which the fire escapes, and those openings are the heavenly bodies we see.[93]

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[92] The word "nineteen" is inserted by Diels to make Hippolytos agree with Aetios (ii. 20. 1, p. 90). With Tannery (*Sc. hell.* p. 91), I prefer "eighteen," and suppose the difference to be due to one account dealing with the internal and the other with the external diameter.

The explanation which Anaximander gave of thunder and lightning was very similar. They were also caused by fire breaking through compressed air, that is to say, through the storm-clouds. It seems to me probable that we have here the origin of the whole theory, and that Anaximander really explained the heavenly bodies on the analogy of lightning, and not *vice versa*. This would be in perfect agreement with the prevailing meteorological interest of the time.[94]

Earth and sea.

19. We turn now to what we are told of the origin of earth and sea from the moist, cold matter which was "separated off" in the beginning, and which filled the inside of the sphere of flame—

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[93] The true sense of this doctrine was long obscured by the "windy paraphrase" of Achilles, on whom see Diels, *Dox.* pp. 18, 19, 25, 26 (quoted R. P. 8*d** and 14*b*). Even Zeller was misled by this in the earlier editions of his great work, and the right view was first given by Teichmüller. Achilles fancied that the heavenly bodies were compared to wheels because their rays resembled spokes; but this is due to a mere misunderstanding of the passage in the *Placita*, which we still possess and can interpret for ourselves. The flames rush forth *per magni circum spiracula mundi*, as Lucretius has it (vi. 493). The πρηστῆρος αὐλός, to which these *spiracula* are compared, is neither a trumpet, as Achilles imagined (*loc. cit.*), nor yet the meteorological phenomenon known as a πρηστήρ (Chap. III. *n.* 53). The word here means simply a pair of bellows, as in Ap. Rhod. iv. 776. The only correction that needs to be made is πόρους τινὰς αὐλώδεις for τόπους τινὰς ἀερώδεις in the *Placita* (*Dox.* pp. 29 and 156). When Diels made this beautiful emendation he was unaware that Cedren, who in the eleventh century A.D. made extracts from Hippolytos, actually has πόρους τινὰς αὐρώδεις.

[94] See the Introduction, § X.

The sea is what is left of the original moisture. The fire has dried up most of it and turned the rest salt by scorching it.—Aet. = *Plac.* iii. 16. 1 (R. P. 14*c*).

He says that the earth is cylindrical in form, and that its height is as a third part of its width.—Ps.-Plut. *Strom.* fr. 2 (R. P. *ib.*).

The earth swings free, held in its place by nothing. It stays where it is because of its equal distance from everything. Its shape is convex and round, and like a stone pillar (?). We are on one of the surfaces, and the other is on the opposite side.[95]—Hipp. *Ref.* i. 6 (R. P. 14 C).

Adopting for a moment the later theory of "elements," we see that Anaximander put fire on one side as "the hot," and all the rest on the other as "the cold," which is also moist. This explains how Aristotle came to speak of the Boundless as intermediate between fire and water. And we have seen also that the moist element was partly turned into "air" or mist by the fire, which explains how he could say the Boundless was something between fire and air, or between air and water.[96]

The moist, cold interior of the world is not, it will be noticed, pure water. It is always called "the moist" or "the moist state." This is because it has to be still further differentiated under the influence of heat into earth, water, and vapour. The gradual drying up of the water by the fire is a good example of what Anaximander meant by "injustice." And we see how this injustice brings about the destruction of the world. The fire will in time dry up and burn up the whole of the cold, moist element. But then it will not be fire any longer; it will be simply the "mixture," if we choose to call it so, of the hot and cold; that is, it will be the same as the Boundless which surrounds it, and will pass away into it.

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[95] The MSS. of Hippolytos have *ὑγρὸν στρογγύλον*. Roeper reads *γυρὸν* [*στρογγύλον*], supposing the second word to be a gloss on the first; but Diels has shown (*Dox.* p. 218) that both are wanted. The first means "convex," and applies to the *surface* of the earth; while the second means "round," and refers to its circuit. As to *κίονι λίθῳ*, it is not easy to say anything positive. It might, possibly, be a mere corruption of *κυλίνδρῳ* (cf. Plut. *Strom.* (R. P. 14*c*)); but, if so, it is a very old one. Aetios (iii. 10. 2), who is quite independent of Hippolytos, has *λίθῳ κίονι*; Roeper suggested *κιονίῃ λίθῳ*; Teichmüller, *κίονος λίθῳ*; while Diels doubtfully puts forward *λιθῷ κίονι*, which he suggests might be a Theophrastean modernisation of an original *λιθίῃ κίονι* (*Dox.* p. 218).

[96] See above, *n.* 64.

The view which Anaximander takes of the earth is a great advance upon anything we can reasonably attribute to Thales. It is no longer regarded, in the primitive way, as a disc stretching out to the horizon and resting on the waters. It occupies the centre of the world, and rests upon nothing at all. Still, Anaximander does not attain to the idea that it is spherical. He believes that we live on a convex disc, and from this the cylindrical form follows as a matter of course. The really remarkable thing is that he should have seen, however dimly, that there is no absolute up and down in the world. Not many of the cosmologists who followed him succeeded in grasping this fact.

Animals.

20. We have seen enough to show us that the speculations of Anaximander about the world were of an extemely daring character; we come now to the crowning audacity of all, namely, his theory as to the origin of living creatures. The Theophrastean account of this has been well preserved by the doxographers—

> Living creatures arose from the moist element as it was evaporated by the sun.[97] Man was like another animal, namely, a fish, in the beginning.—Hipp. *Ref.* i. 6 (R. P. 16*a*).

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[97] I accept the emendation of Diels, which is also adopted in R. P. (*loc. cit.*).

Further, he says that in the beginning man was born from animals of a different species. His reason is, that, while other animals quickly find food for themselves, man alone requires a prolonged period of suckling. Hence, had he been originally such as he is now, he could never have survived.—Ps.-Plut. *Strom.* fr. 2 (R. P. 16).

The first living creatures were produced in the moist element, and were covered with prickly integuments. As time went on they came out upon the drier part, and, the integument soon breaking off,[98] they changed their manner of life.—Aet. = *Plac.* v. 19. 1 (R. P. *ib.*).

These statements hardly require comment. It has, however, been said that the theories advanced by Anaximander have no scientific worth, and that they are mere dogmas based upon some half-Oriental mythical foundation; so it becomes necessary to point out that, by a rare piece of good fortune, not only the opinions have been preserved, but also the grounds upon which they were formed. Now these grounds, however crudely they may have been formulated, were, as appears especially from the second of the three passages just given, of a thoroughly scientific character. The reference to the long period of nursing required by the offspring of the human race really contains a very acute piece of scientific reasoning.

Theology.

21. In the course of our discussion on the "innumerable worlds," we found that Anaximander regarded these as gods. They were not, however, eternal, but had both a beginning and an end in time,[99] the attribute of eternity being confined to the boundless primary sub-

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[98] Tannery, *Science hellène*, p. 80, *n.* 1, makes the very plausible suggestion, that this part of the theory was derived from observation of certain aquatic *larvæ*, *e.g.* those of gnats.

[99] R. P. 15.

stance from which they arose. Of course, then, that was also regarded as divine.[100] We shall see in the sequel how this view developed; at present we need only note the wide interval which separates these "gods" from those of popular religion and the anthropomorphic poets.

III. ANAXIMENES.

22. Anaximenes of Miletos, son of Eurystratos, was, **Life.** according to Theophrastos, an "associate" of Anaximander.[101] If we accept the very probable emendation of Diels, Apollodoros said he "flourished" about the time of the fall of Sardeis, and died in Ol. LXIII. (528–525 B.C.).[102]

The following table will show, however, that these dates were purely conjectural:—

Ol.	*Thales.*	*Anaximenes.*
38	Born.	
48	Flourished.	Born.
58	Died.	Flourished.
63		Died.

It will be observed that just twenty-five Olympiads, three generations, or a hundred years, are allowed from the birth of Thales to the death of Anaximenes, and the latter is made to die at the age of sixty simply to make him fit into the *schema.* We cannot, therefore, say anything positive as to his date, except that he must have been younger than Anaximander, and must have flourished before 494 B.C., when the school was doubtless broken up by the destruction of Miletos.

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[100] R. P. 13 and 13*b*.

[101] *Phys. Op.* fr. 3 (*Dox.* p. 476, 16).

[102] According to our text of D. L. ii. 3 (R. P. 17 A), he "flourished" in Ol. LXIII. and died at the time of the fall of Sardeis. This was formerly supposed to mean the capture of that city by the revolted Ionians; but the statement of Souidas, *s.v.* (R. P. 17*c*), that the capture by Cyrus in 546 B.C. is meant, is made probable by the fact that this is one of Apollodoros' regular eras. Besides, Hippolytos tells us (*Ref.* i. 7; R. P. 17 B) that Anaximenes flourished in Ol. LVIII. (549-546 B.C.). Clearly, then, we must transpose the dates with Diels (*Rh. Mus.* xxxi. 27).

His book.

23. Anaximenes wrote a book which certainly survived until the age of literary criticism; for we are told that he used a simple and unadorned Ionic,[103] very different we may suppose, from the poetical prose of Anaximander.[104] We may probably trust this criticism, which comes ultimately from the scholars of Alexandria; and, if it is just, it furnishes a good illustration of the truth that the character of a man's thoughts is sure to find expression in his style. We have seen that the speculations of Anaximander were distinguished for their hardihood and breadth; those of Anaximenes are marked by just the opposite quality. He appears to have thought out his system carefully, but he rejects the more audacious theories of his predecessor. The result is, that, while his view of the world is on the whole much less like the truth than Anaximander's, it is, perhaps, more fruitful in ideas that were destined to hold their ground.

Theory of the primary substance.

24. Anaximenes is one of the philosophers on whom Theophrastos wrote a special monograph;[105] and this, of course, gives us an additional guarantee for the trustworthiness of the tradition derived from his great work, the *Opinions.* The following[106] are the passages which seem to contain the fullest and most accurate account of

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[103] D. L. ii. 3 (R. P. 17 A).

[104] Cf. the estimate of Theophrastos quoted above, § 12.

[105] On these monographs see *Dox.* p. 102.

[106] See the conspectus of extracts from Theophrastos given by Diels, *Dox.* p. 135.

what he had to say on the central feature of the system :—

> Anaximenes of Miletos, son of Eurystratos, who had been an associate of Anaximander, said, like him, that the underlying substance was one and infinite. He did not, however, say it was indeterminate, like Anaximander, but determinate; for he said it was Air.—*Phys. Op.* fr. 3 (*Dox.* p. 476, R. P. 19 B).
>
> From it, he said, the things that are, and have been, and shall be, the gods and things divine, took their rise, while other things come from its offspring.—Hipp. *Ref.* i. 7 (R. P. 21).
>
> "Just as," he said, "our soul, being air, holds us together, so do breath and air encompass the whole world."—Aet. i. 3. 4 (R. P. 18).
>
> And the form of the air is as follows. Where it is most even, it is invisible to our sight; but cold and heat, moisture and motion, make it visible. It is always in motion; for, if it were not, it would not change so much as it does.—Hipp. *Ref.* *l.c.* (R. P. 21).
>
> It differs in different substances in virtue of its rarefaction and condensation.—Simpl. *Phys.* p. 24 D (R. P. 19 B).
>
> When it is dilated so as to be rarer, it becomes fire; while winds, on the other hand, are condensed Air. Cloud is formed from Air by "felting;"[107] and this, still further condensed, becomes water. Water, condensed still more, turns to earth; and when condensed as much as it can be, to stones.—Hipp. *Ref.* *l.c.* (R. P. 21).[108]

Rarefaction and condensation.

25. At the first glance, this theory undoubtedly looks like a retrogression from the more refined doctrine of Anaximander to a cruder view; but a moment's reflection will show that this is by no means the case. On the contrary, the introduction of rarefaction and condensation into the theory is really a notable advance.[109] In fact, it

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[107] "Felting" (πίλησις) is the regular term for this process with all the early cosmologists.

[108] A more condensed form of the same doxographical tradition is given by Ps.-Plut. *Strom.* fr. 3 (R. P. 19 A).

[109] Simplicius, p. 149 D (R. P. 19 *b*), says, according to the MS.

makes the Milesian cosmology thoroughly consistent and intelligible for the first time; since it is clear that a system which explains everything by the transformations of a single substance, is bound to refer all differences to a purely quantitative standard. The infinite substance of Anaximander, from which the opposites "in it" are "separated out," cannot, strictly speaking, be thought of as homogeneous throughout, and the only way to save the unity of the primary substance, is to treat all diversities as due to the presence of more or less of it in a given space. And, when once this important step has been taken, it is no longer necessary to make the primary substance something "other than the elements"; it may just as well be one of them.

Air. 26. The "air" of which Anaximenes spoke was not at all what we call by that name. The word ἀήρ is still used in its old Homeric sense of vapour or mist.[110] The discovery that what we call air was corporeal, and not identical with empty space, was first made by Empedokles.[111] In all the earlier cosmologists, ἀήρ means water in a vaporous state, more or less condensed.

It was natural for Anaximenes to fix upon air in this sense as the primary substance; for, in the system of Anaximander, it occupied the intermediate place between the two fundamental opposites, the sphere of flame and the cold, moist mass inside it, being produced, indeed, by the action of the one upon the other (§ 18). We know from Plutarch that Anaximenes fancied air became

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reading, that Theophrastos spoke of rarefaction and condensation in the case of Anaximenes *alone*. This is impossible; we must read *πρώτου* for *μόνου*, with Usener.

[110] There is an instructive discussion on the meaning of the word in Schmidt, *Synonymik*, § 35. It is partially quoted in Chap. IV. *n.* 37.

[111] See Chap. V. § 85.

warmer when rarefied, and colder when condensed. Of this he satisfied himself by a curious experimental proof. When we breathe with our mouths open, the air is warm; when we breathe with our lips closed, it is cold.[112]

The world breathes.

27. This argument from human breathing brings us naturally to a very curious point in the theory of Anaximenes, which is attested by the single fragment which has come down to us.[113] "Just as our soul, being air, holds us together, so do breath and air encompass the whole world." The primary substance bears the same relation to the life of the world as to that of man. The world, in fact, is represented as breathing; it is kept up by the draughts of air which it inhales from the infinite mass beyond the heavens. Now this, as we shall see, was just the Pythagorean view;[114] and it is, on the whole, more likely that Pythagoras got it from Anaximenes than *vice versa*.[115] At any rate, it is an early instance of the argument from the microcosm to the macrocosm, and it also marks the first beginnings of an interest in physiological matters.

The parts of the world.

28. We turn now to the doxographical tradition concerning the formation of the world and its parts—

> He says that, as the air was "felted," the earth first came into being. It is very broad, and is accordingly supported by the air.—Ps.-Plut. *Strom.* fr. 3 (R. P. 19 A).
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> In the same way, the sun and the moon and the other

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[112] *De pr. frig.* 947 (R. P. 20).

[113] It is preserved by Aetios, i. 3. 3 (R. P. 18). He got it ultimately from Theophrastos, through the biographical work which he used for his chapter περὶ ἀρχῶν, *Dox.* p. 179.

[114] See Chap. II. § 42.

[115] See, however, A. Chiapelli, *Zu Pythagoras and Anaximenes*, in *Arch.* i. p. 582 sq.

heavenly bodies, which are of a fiery nature, are supported by the air because of their breadth. The heavenly bodies were produced from the earth by moisture rising from it. When this is rarefied, fire comes into being, and the stars are composed of the fire thus raised aloft. There were also bodies of earthy substance in the region of the stars, revolving along with them. And he says that the heavenly bodies do not move under the earth, as others suppose, but round it, as a cap turns round our head. The sun is hidden from sight, not because it goes under the earth, but because it is concealed by the higher parts of the earth, and because its distance from us becomes greater. The stars give no heat because of the greatness of their distance.

Winds are produced when condensed air rushes into rarefied; but when it is concentrated and thickened still more, clouds are generated; and, lastly, it turns to water.[116]—Hipp. *Ref.* i. 7 (R. P. 21).

The stars are fixed like nails in the crystalline vault of the heavens.—Aet. ii. 14. 3 (*Dox.* p. 344).

They do not go under the earth, but turn round it.—*Ib.* i. 16. 6 (*Dox.* p. 346).

The sun is fiery.—*Ib.* 20. 2 (*Dox.* p. 348).

It is broad like a leaf.—*Ib.* 22. 1 (*Dox.* p. 352).

The heavenly bodies are diverted from their courses by the resistance of compressed air.—*Ib.* 23. 1 (*Dox.* p. 352).

The moon is of fire.—*Ib.* 25. 2 (*Dox.* p. 356).

Anaximenes explained lightning like Anaximander (p. 70), adding as an illustration what happens in the case of the sea, which flashes when divided by the oars.—Aet. iii. 3. 2 (*Dox.* p. 368).

Hail is produced when water freezes in falling; snow, when there is some air imprisoned in the water.—*Ib.* 4. 1 (*Dox.* p. 370).

The rainbow is produced when the beams of the sun fall on thick condensed air. Hence the anterior part of it seems red, being burnt by the sun's rays, while the other part is dark, owing to the predominance of moisture. And he says that a rainbow is produced at night by the moon; but not often, because there is not constantly a full moon, and because the moon's light is weaker than that of the sun.—*Schol. Arat.*[117] (*Dox.* p. 231).

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[116] The text is very corrupt here. I retain *ἐκπεπυκνωμένος*, because we are told above that winds are condensed air, and I adopt Zeller's *ἀραιῷ εἰσφέρηται*. Z.^{5} p. 246, *n.* 1.

The earth was like the slab of a table in shape.—Aet. iii. 10. 3 (*Dox.* p. 377).

The cause of earthquakes was the dryness and moisture of the earth, occasioned by droughts and heavy rains respectively.—*Ib.* 15. 3 (*Dox.* p. 379).

We have seen that Anaximenes was quite justified in going back to Thales in regard to his general theory of the primary substance; but it cannot be denied that the effect of this upon the details of his cosmology was unfortunate. The earth is once more imagined as a table-like disc floating upon the air. The sun, moon, and planets are also fiery discs which float on the air "like leaves." It follows that the heavenly bodies cannot be thought of as going under the earth at night, but only as going round it laterally like a cap or a millstone.[118] This curious view is also mentioned in Aristotle's *Meteorology*,[119] where the elevation of the northern parts of the earth, which makes it possible for the heavenly bodies to be hidden from sight, is also referred to. In fact, whereas Anaximander had regarded the orbits of the sun, moon, and stars as oblique with reference to the earth, Anaximenes regarded the earth itself as inclined. The only real advance is the clear distinction of the planets, which float freely in the air, from the fixed stars, which are fastened to the sky.

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[117] The source of this is Poseidonios, who used Theophrastos. *Dox.* p. 231.

[118] Theodoret (*Gr. Aff. Cur.* iv. 16) speaks of those who believed in a revolution like that of a millstone, as contrasted with one like that of a wheel. Diels (*Dox.* p. 46) refers these similes to Anaximenes and Anaximander respectively. They come, of course, from Aetios (*Note on Sources*, B, § 10), though they are given neither by Stobaios nor in the *Placita.*

[119] B, 1. 354*a*, 28 (R. P. 21c).

The earthy bodies, which circulate among the planets, are doubtless intended to account for eclipses and the phases of the moon.[120]

Innumerable worlds.

29. As might be expected, there is the same difficulty about the "innumerable worlds" ascribed to Anaximenes as in the case of Anaximander, and most of the arguments given above (§ 17) apply here also. In addition, we must note the following points. Cicero says that Anaximenes regarded air as a god, and adds that it came into being.[121] That there is some confusion here is obvious. Air, as the primary substance, is certainly eternal. Now, it is quite likely that Anaximenes called Air "divine," as Anaximander did the Boundless; but it is certain that he believed as well in gods who came into being and passed away. These arose, he said, from the air. This is expressly stated by Hippolytos,[122] and also by St. Augustine.[123] These gods can only be the "innumerable worlds." Simplicius, indeed, takes another view;[124] but I believe he was misled by some Stoic authority.

[120] See Tannery, *Science hellène*, p. 153. Teichmüller understood the references to these dark planets to mean the solid vault of heaven; Zeller formerly regarded them as solid *nuclei* of the heavenly bodies. For the precisely similar bodies assumed by Anaxagoras, see below, Chap. VI. § 111.

[121] N. D. i. 25 (R. P. 21*b*). On what follows see Krische, *Forschungen*, p. 52 sqq.

[122] *Ref.* i. 7. 1 (R. P. 21).

[123] *Civ. Dei*, viii. 2: *Anaximenes omnes rerum causas infinito aeri dedit: nec deos negavit aut tacuit; non tamen ab ipsis aerem factum, sed ipsos ex aere ortos credidit.*

[124] *Phys. f.* 257*v* (R. P. 21*a*). The passage from the *Placita* is of far higher authority than this from Simplicius. Note, further, that it is only to Anaximenes, Herakleitos, and Diogenes that successive worlds are ascribed even here. With regard to Anaximander, Simplicius is quite clear. For the Stoic view of Herakleitos, see Chap. III. § 62; and for Diogenes, Chap. IX. § 158.

CHAPTER II.

SCIENCE AND RELIGION.

Migrations to the West.

30. So far we have not met with any trace of conscious opposition between science and popular beliefs, though the views of the Milesian cosmologists were really as inconsistent with the religions of the people as with the mythology of the anthropomorphic poets.[1] Two circumstances combined to hasten on the inevitable conflict, the shifting of the scene to the West, and the religious revival which swept over Hellas in the sixth century B.C.

The chief figures in the philosophical history of this period were Pythagoras of Samos and Xenophanes of Kolophon. Both were Ionians, and yet both spent the greater part of their lives in the West. The advance of the Persian power in Asia Minor had occasioned an extensive migration to Sicily and Southern Italy, of which Herodotos has given us a vivid idea by sketching a few of its most characteristic episodes;[2] and this must, no doubt, have had a great influence on the development of philosophy. The new views had probably grown up so gradually in Ionia that the shock of conflict and reaction was avoided; but this could no longer be the case when they were suddenly transplanted to a region where men were wholly unprepared to receive them.

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[1] For the theological views of Anaximander and Anaximenes, see §§ 21 and 29.

[2] Cf. Herod. i. 170 (advice of Bias), vi. 22 sqq. (Kale Akte).

Another, though a somewhat later, effect of the migration was to bring Science into contact with Rhetoric, perhaps the most characteristic product of Western Hellas. Even in Parmenides we may note the presence of that dialectical and controversial spirit which was destined to have so great an influence upon Greek thought, and it was this fusion of the art of arguing for victory with the search for truth that incidentally gave birth to Logic.[3]

The religious revival.

31. We pass now to the second of the two influences mentioned above. Recent researches in a different field have thrown an entirely new light upon such phenomena as the Orphic and other *Orgia*,[4] which at this time began to spread themselves far and wide. We now know that all these religious manifestations were no innovations; but, on the contrary, revivals in a slightly altered form of what were really very primitive usages indeed.[5] A recrudescence of superstitious feeling and practice is a very common thing in all seasons of public anxiety or distress; and this was emphatically such a period in Hellas, threatened as it was at once by Persians on the east and Carthaginians on the west. An age of despondency and even of despair was setting in, and this has left its mark on all the thought of the time.[6] It does not seem likely, however, that this was due to political causes alone; even at Athens, which was not immediately

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[3] See *Introduction*, § I. Gorgias is the typical figure.

[4] This is the oldest word for what were more often called "Mysteries" in later times. Both words have misleading associations for us. The word *Orgia* (cf. ἔοργα) means no more than religious rites, which need not be "orgiastic" in character any more than Mysteries need be mystical.

[5] Professor Robertson Smith's *Lectures on the Religion of the Semites* [1889] throw more light upon ancient religion generally than any other work known to me. Specially important for our present purpose are pp. 339 sqq.

[6] On this point cf. v. Wilamowitz-Möllendorf, *Hom. Unters.* p. 215 sqq.

threatened [illegible] the medicine-man [illegible] Crete to purify [illegible] tracted in the [illegible] himself [illegible] based upon the same [illegible] gether foreign [illegible] not wholly pass away [illegible] Salamis [illegible] for summer in [illegible] forgotten when Hellas was [illegible]

It was no [illegible] exactly the [illegible] might and [illegible] mainland Hellas [illegible] had been [illegible] up the old [illegible] with which the primitive [illegible] were inseparably entwined, and the place of these had been taken by an [illegible] more or less Panhellenic polytheism. [illegible] craving once more for something that would come nearer home to themselves, and above all for something more efficacious and practical. The Athene and Apollo who were worshipped all over Hellas could not possibly attend to their votaries as the old local deities had attended to the narrow circle of tribesmen over whom they presided. There was nothing for it, then, but to set up artificial

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[7] Plut. *Solon*, 12, after Hermippos. See the interesting remarks of Grote, vol. iii. p. 81 sq.

[8] Grote, i. 24. Purification for blood-guiltiness seems to have been first mentioned in the *Aithiopis* of Arktinos. Kinke[illegible] *Fr.* i. 33.

[9] A characteristic savage trait in the Athe[illegible] ence of this time was the provision for the trial of inanimat[illegible] Prytaneion (Demosth. *Aristokr.* 76).

communities,[10] based, not upon the tie of kindred blood, but upon ceremonies of initiation and purification.[11] This is not the place for a detailed account of the Greek mysteries;[12] but it may be briefly pointed out that the Eleusinian and Orphic *Orgia* did not differ fundamentally from the rest. The Eleusinia gained greater dignity from being taken over by the Athenian State, and the Orphika seem to have been more widely spread and more highly organised than others; but their origin was similar. The former seem to have developed from an imitative reproduction of the processes of sowing, growing, reaping, threshing, and the like, intended to secure the goodness of the crops and vintage by "sympathetic magic"; the latter were an elaborate system of purification and taboo intended to protect the "soul" from the ghostly perils to which it is constantly exposed. These rites certainly did suggest to some of the spectators more or less exalted ideas of the life to come, but this was wholly foreign to their original purpose. Their founders never thought of the sublime interpretations of a Pindar or a Sophokles.

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[10] On these associations see Foucart, *Les Associations Religieuses chez les Grecs.* The ὀργεῶνες attached to an Attic γένος had, no doubt, a similar origin. The constitution of the society (θίασος) of Orgeones in the Peiraieus is pretty fully known from inscriptions. Of course, many of these societies were composed of foreigners who wished to keep up their native worships; but no one was excluded, not even women and slaves. Isagoras and his kindred worshipped the Karian Zeus (Herod. v. 66).

[11] Robertson Smith, *loc. cit.*: "The leading feature that distinguished them (the Semitic mysteries of the seventh century B.C.) from the old public cults with which they came into competition, is that they were not based on the principle of nationality, but sought recruits from men of every race who were willing to accept initiation through the mystic sacraments." This applies as well to Greek as to Semitic mysteries, except that "barbarians" (ὅστις φωνὴν μὴ ξυνετός) were excluded from the Eleusinia.

[12] Lobeck's *Aglaophamus* is still essential for an understanding of the Mysteries. See also Prof. Ramsay's article on them in the *Encyclopædia Britannica* (where too much weight is attached to the speculations of late authorities), and Mr. Purser's *Eleusinia*, *Mysteria*, and *Orphica*, in the *Dictionary of Antiquities*. Mr. J G. Frazer's *Golden Bough* is full of suggestive ideas on this subject; perhaps he has not strictly proved all his points, but he is certainly on the right road. It is well known that the drama was derived from magical imitations of the kind referred to in the text. Surely the word itself comes from δρᾶν in its specially religious sense, and has not the meaning of "pantomime," which Dr. Verrall gives it in his Introduction to the *Agamemnon*, p. xlviii.

Influence of the religious revival on philosophy.

32. All this influenced philosophy as it influenced everything else, but not in the way we should most naturally expect. With us a religious movement generally means the sudden realisation of a new or forgotten idea; but the Greek mysteries and cults did not embody ideas, they contained nothing in the least degree resembling dogma. The initiated, Aristotle said, were not supposed to learn anything, but merely to be affected in a certain way and put into a certain frame of mind.[13] Ancient religions cared nothing for a man's belief, if only it did not set him in open opposition to the public worship of the State, and, so long as the proper ceremonial was correctly performed, any explanation of it that occurred to the spectator might be given. He might believe or disbelieve that the Mysteries taught the doctrine of immortality; the essential thing was that he should duly sacrifice his pig. It follows, then, that the Mysteries cannot have suggested any ideas to philosophy, and that their influence was merely external.

Philosophy as a life.

33. The chief way in which religion influenced Greek thought through such men as Pythagoras was by introducing the idea that philosophy was above all things a way of life. For good and for evil this view took firm hold of the Greek mind; it was never again lost sight of, and the ideal wise man became a standing type. The

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[13] Arist. *ap.* Synes. *Dion.* 10, p. 271, Krab.: *τοὺς τελουμένους οὐ μαθεῖν τι δεῖν ἀλλὰ παθεῖν καὶ διατεθῆναι.*

different results to which this gave rise were, however, of very unequal value. On the one hand, the ideal, after becoming incarnate in Sokrates, led up to the Stoic sage and the Christian saint; on the other, it gave birth to the whole brood of impostors whom Lucian has pilloried for our edification. It certainly enabled Greek philosophy to do for men what religion has done for them in other ages; but it also paved the way for the destruction of philosophy itself. The Neoplatonists were quite justified in regarding themselves as the spiritual heirs of Pythagoras; and, in their hands, philosophy ceased to exist as such, and became theology. And this tendency was at work all along; hardly a single Greek philosopher was wholly uninfluenced by it. Perhaps Aristotle might seem to be an exception; but it is probable that, if we still possessed a few such "exoteric" works as the *Protreptikos* in their entirety, we should find that the enthusiastic words in which he speaks of the "blessed life" in the *Metaphysics* and in the *Ethics* were less isolated outbursts of feeling than they appear now. In later days, Apollonios of Tyana showed in practice what this sort of thing must ultimately lead to. The theurgy and thaumaturgy of the late Greek schools were only the fruit of the seed sown by the generation which immediately preceded the Persian War.[14]

[14] In *Rep.* x. 600 A, Plato speaks of Pythagoras as the introducer of a private ὁδός τις βίου, contrasting him with public legislators like Solon and Charondas. Zeller quotes (p. 5, *n.* 1) the following examples of φιλοσοφία in the sense of an ascetic way of life: καὶ οἱ μὲν (sc. οἱ Βόσκοι) ὧδε ἐφιλοσόφουν (Sozomen, *H. Ekkl.* vi. 33); πάτριος φιλοσοφία, of the Therapeutai and Essenes (Philo, *De vita contempl.* 893 D). Lucian's *Auction of Lives* is a satire on the whole thing. Apollonios of Tyana (*c.* 50 A.D.) was worshipped along with Pythagoras by the adherents of his sect.

I. PYTHAGORAS.

Character of the tradition.

34. It is no easy task to give an account of Pythagoras that can make any claim to be regarded as history.[15] Our principal sources of information are the *Lives* composed by Iamblichos, Porphyry, and "Diogenes Laertios." That of Iamblichos is a wretched compilation, based chiefly upon the work of the mathematical theologian Nikomachos of Gerasa, and upon the romance of Apollonios of Tyana, who regarded himself as a second Pythagoras, and accordingly took great liberties with his materials.[16] Porphyry stands, as a writer, on a far higher level than Iamblichos; but his authorities do not inspire us with much more confidence. He, too, made use of Nikomachos, and of a certain novelist called Antonius Diogenes, author of a work entitled, *Marvels from beyond Thule.*[17] "Diogenes Laertios" quotes, as usual, a considerable number of authorities, and the statements he makes must be estimated according to the nature of the several sources from which they were drawn.[18] So far, it must be confessed, our material does

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[15] See E. Rohde's admirable papers, *Die Quellen des Iamblichus in seiner Biographie des Pythagoras* (*Rhein. Mus.* xxvi. and xxvii.). I have followed these closely in this section.

[16] Iamblichos was originally a disciple of Porphyry, and was contemporary with Constantine. *The Life of Pythagoras* has been edited by Nauck (1884). Nikomachos of Gerasa (in Arabia) belongs to the second century A.D. There is no evidence that he added anything to the authorities he followed, but these were already hopelessly vitiated by Neopythagorean fables. Still it is to him we chiefly owe the preservation of the valuable evidence of Aristoxenos.

[17] Porphyry's *Life of Pythagoras* is the only considerable extract from his *History of Philosophy*, in four books, that has survived. It was doubtless saved, as Bernays suggests, by the marvels related in it (*Theophr. Schr.* p. 1). The romance of Antonius is the original parodied by Lucian in his *Vera Historia.*

[18] The importance of the life in Diogenes Laertios consists in the fact

not seem very promising. Further examination shows, however, that there are a good many fragments of two much older authorities, Aristoxenos and Dikaiarchos, embedded in the mass, and this gives us some hope. These two writers were both disciples of Aristotle; they were natives of Southern Italy, and contemporary with the last generation of the Pythagorean School. Both wrote accounts of Pythagoras; and Aristoxenos, who was personally intimate with the last representatives of scientific Pythagoreanism, also made a collection of the sayings of his friends. Now the Neopythagorean story, as we have it in Iamblichos, is a tissue of incredible and fantastic myths; but, if we sift out the statements which go back to Aristoxenos and Dikaiarchos, we can easily construct a tolerably rational and connected narrative, in which Pythagoras appears, not as a miracle-monger and religious innovator, but simply as a gifted moralist and statesman. We might then be tempted to suppose that we have here the genuine tradition; but Rohde has shown that this would be altogether a mistake. There is, in fact, a third and still earlier stratum of tradition to be found in the *Lives*, and this agrees with the latest accounts in representing Pythagoras as a wonder-worker and as a religious reformer.

Some of the most striking miracles of Pythagoras are related on the authority of Andron's *Tripod*, and of the work on the Pythagoreans which is ascribed to Aristotle.[19]

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that it gives us the story current at Alexandria before the rise of Neopythagoreanism and the promulgation of the gospel according to Apollonios of Tyana.

[19] Andron of Ephesos wrote a work on the Seven Wise Men, called, apparently, *The Tripod*. The title alludes to the well known story. The feats ascribed to Pythagoras in the Aristotelian treatise remind us of an ecclesiastical legend. For example, he kills a deadly snake by biting it; he

Both of these treatises seem to belong to the fourth century B.C.; and, in any case, they must certainly have been written long before the rise of Neopythagoreanism.

And it is only by assuming the still earlier existence of this view that we can explain the allusions of Herodotos. The Hellespontine Greeks told him that Salmoxis or Zamolxis had been a slave of Pythagoras,[20] and they must therefore have regarded the latter as a man who taught strange doctrines concerning the life after death.

It seems, then, that both the oldest and the latest accounts agree in representing Pythagoras as a man of the class to which Epimenides and Onomakritos belonged, in fact, as a sort of "medicine-man." For some reason, however, there was an attempt to save his memory from this imputation, and that attempt belonged to the fourth century B.C. The significance of this will appear in the sequel.

Life of Pythagoras.

35. We may be said to know for certain that Pythagoras was a Samian, and the son of Mnesarchos; and he "flourished," we are told, in the reign of Polykrates.[21]

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was seen at Kroton and Metapontion at the same time; he exhibited his golden thigh at Olympia, and was addressed by a voice from heaven when crossing the river Kosas. The same authority stated that he was identified by the Krotoniates with Apollo Hyperboreios (Arist. fr. 186).

[20] Herod. iv. 95 (R. P. 41).

[21] For the nationality and parentage of Pythagoras we have the excellent authority of Herodotos, iv. 95 (R. P. 41 A), and Herakleitos, fr. 17, Byw. (R. P. 24*a*). There were two widely different dates given for his "floruit" in antiquity. Eratosthenes (ap. D. L. viii. 47) identified him with an Olympian victor belonging to Ol. XLVIII. 1 (588 B.C.); but this cannot be reconciled with what we otherwise know. The other date, given by Apollodoros, is based on the statement of Aristoxenos, quoted by Porphyry (*V. Pyth.* 9), that Pythagoras left Samos from dislike to the tyranny of Polykrates (R. P. 44*a*). This gives 533–2 or 529–8 B.C., according to the date assumed for Polykrates (Busolt, *Gr. Gesch.* ii. p. 233, *n.* 1). It will be noticed that we have here a case where Apollodoros corrects his authority Eratosthenes. (See *Note on Sources*, D.)

This date cannot be far wrong; for Herakleitos already speaks of him in the past tense.[22] It is also certain that he founded his society at Kroton, a city which stood in the closest relations with Samos; but beyond this we have only probabilities to guide us.

The extensive travels attributed to Pythagoras by late writers are, no doubt, apocryphal. Even the statement that he visited Egypt, though it is far from improbable if we consider the close relations between Polykrates of Samos and Amasis, rests on no sufficient authority; for it first occurs in the *Bousiris* of Isokrates,[23] a work which does not even pretend to be historical. Herodotos, it is true, observes that the Pythagorean rule not to wear wool in temples agreed with the Egyptian custom, but he says nothing of its having been derived from Egypt.[24] He says also in another place that the belief in transmigration came from Egypt, though certain Greeks, both at an earlier and a later date had passed it off as their own. He refuses, however, to give their names, so we cannot tell whether he was thinking of Pythagoras or not.[25] Nor does it matter; for the Egyptians did not, as a matter of fact, believe in transmigration at all, and Herodotos was simply deceived by the symbolism of the monuments. The other stories as to the wanderings of Pythagoras are palpable inventions, and need not even be mentioned here. Aristoxenos said that Pythagoras left Samos in order to escape from the tyranny of Polykrates.[26] This is quite possible; for, of course, no tyrant would have tolerated the formation of a society such as his. On leaving Samos, he chose Kroton for his abode, and there established his order. How long he remained in that city we do not know; he died at Metapontion, whither he had retired on the first signal of revolt against his influence.[27]

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[22] Fr. 16 and 17, Byw. (R. P. 24 and 24*a*). [23] 11. 28 (R. P. 43).

[24] Herod. ii. 81 (R. P. 43*a*). According to Stein, the oldest family of MSS. simply reads, "they agree with the so-called Orphics and Pythagoreans." The words καὶ Βακχικοῖσι . . . Αἰγυπτίοισι are a gloss.

[25] Herod. ii. 123. If Herodotos had known of the visit to Egypt he would almost certainly have mentioned it here.

[26] Ap. Porphyry, *Life of Pythagoras*, c. 9 (R. P. 44*a*).

The Order.

36. There is no reason to believe that the detailed accounts which have been handed down to us with regard to the organisation of the Pythagorean Order rest upon any historical basis. In the case of many of these statements we can still see exactly how they came to be made. The distinction of grades within the Order, variously called *Mathematicians* and *Akousmatics*, *Esoterics* and *Exoterics*, *Pythagoreans* and *Pythagorists*,[28] is a mere invention designed to explain how there came to be two widely different sets of people, each calling themselves the disciples of Pythagoras, in the fifth and fourth centuries B.C. So, too, the statement that the Pythagoreans were bound to inviolable secrecy, which goes back to Aristoxenos,[29] is intended to explain why there is no

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[27] It may be taken as certain that Pythagoras spent his last days at Metapontion; Aristoxenos said so (ap. Iambl. *V. Pyth.* 249), and Cicero (*De Fin.* v. 4) speaks of the honours which continued to be paid to his memory in that city (R. P. 48*c*). Cf. also Andron, fr. 6 (F. H. G. ii. 347).

[28] For these distinctions see Porphyry (*V. Pyth.* 27) and Iamblichos (*V. Pyth.* 81), quoted R. P. 47 and 47*b*. The name ἀκουσματικοί is clearly related to the ἀκούσματα, with which we shall have to deal shortly (§ 39).

[29] For the "mystic silence," see Aristoxenos, ap. D. L. viii. 15 (R. P. 46*a*). Tannery, *Sur le secret dans l'école de Pythagore* (*Arch.* i. p. 28 sqq.), thinks that the mathematical doctrines were the secrets of the school, and that these were divulged by Hippasos. But the most reasonable view is that there were no secrets at all except of a ritual kind. Aristoxenos and his friends, however, had to make out that the mathematical science and the theory of numbers went back to the early days of Pythagoreanism, and, at the same time, to explain how there was no trace of them before the end of the fifth century. For this purpose the theory of a "mystic silence" was very convenient.

trace of the Pythagorean philosophy before Philolaos. Later on, when it was thought desirable to credit Pythagoras with the whole philosophy of Plato and Aristotle, the "mystic silence" was, of course, alleged in explanation of the fact that the oldest Pythagorean writings showed no trace of the theory of Ideas.

The Pythagorean Order was simply, in its origin, a religious fraternity of the type described above, and not, as has sometimes been maintained, a political league.[30] It certainly did become a political force; but for all that its primary purpose must simply have been to secure for its own members, by means of a system of ritual and taboo, a more adequate satisfaction of the religious instinct than that supplied by the State religion. It was, in fact, an institution for the cultivation of ceremonial holiness. From the nature of the case, however, an independent society within a Greek State was apt to be brought into conflict with the larger body. The only way in which it could then assert its right to exist was by identifying the State with itself, that is, by securing the control of the sovereign power. The history of the Pythagorean Order, so far as it can be traced, is, accordingly, the history of an attempt to supersede the State; and its political action is best explained as a mere incident of this attempt. The only way in which the Pythagoreans could hope to realise their design was by allying themselves with the aristocratic party. It was obviously more reasonable to try to convert a small governing body to Pythagoreanism than to preach to the masses, who were never likely to be won over. Indeed, a whole State consisting of Pythagoreans alone could hardly have maintained its existence; and this, as we know from Porphyry,[31] was one of the arguments employed against the society when it was revived at a later date. The answer to it was, of course, obvious. The Pythagoreans did not wish to convert everybody, but aimed at being a "peculiar people."

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[30] Plato, *Rep.* x. 600 A, implies that Pythagoras held no public office. The view that the Pythagorean sect was a political league, maintained in modern times by Krische (*De societatis a Pythagora conditæ scopo politico*, 1830), goes back, as Rohde has shown (*loc. cit.*), to Dikaiarchos, the champion of the "Practical Life," just as the view that it was a scientific society goes back to the mathematician and musician Aristoxenos. The former antedated Archytas, just as the latter antedated Philolaos (see Chap. VII. § 114). Grote's good sense enabled him to see this quite clearly (vol. iv. p. 329 sq.). It is perhaps worth while to point out the absurdity of the connection which Otfried Müller imagined between Pythagoreanism and his favourite "Dorian State." Pythagoras was an Ionian, and Kroton was not a Dorian but an Achaian city, or, at any rate, if we say that the Achaians were Dorians, we must use the word in a wider sense than O. Müller's, and this would deprive his remarks of all point.

For a time the new Order seems actually to have succeeded in securing the supreme power, but the reaction soon came. Under the leadership of one Kylon, the democracy of Kroton was able to assert itself victoriously against the domination of the religious Order which ruled the State. This, we may well believe, had been galling enough. The "rule of the saints" would be nothing to it; and we can still imagine and sympathise with the irritation felt by the plain man of those days at having all his legislation done for him by a set of incomprehensible pedants, who made a point of abstaining from beans, and would not let him beat his own dog, because they recognised in its howls the voice of a departed friend.[32] This feeling would be aggravated by the private religious worship of the society. Greek democracies could never pardon the introduction of new gods. Their objection to this was not, however, that the gods in question were false gods. If they had been so, it would not have mattered so much. What they could not tolerate was that any one should establish a private means of communication between himself and the unseen powers. This introduced, as it were, an unknown and incalculable element into the arrangements of the State, which might very likely be hostile to the democracy, and was in any case a standing menace to the mass of the citizens, who had no means of propitiating the intruding divinity. And it was nearly as bad to worship the ordinary gods of the State in a private way; for it was manifestly unfair that any section of the community should have access to the supreme dispensers of good and ill at times and seasons when the ordinary man was excluded. The religious creed of the Greek citizen may, in short, be summed up in the single tenet promulgated by the Delphic oracle, that all must worship "according to the use of the city," and none must be suffered to gain the private ear of the gods for the furtherance of his own ends. Were this the place, it would be interesting to follow out the history of this feeling, and to show how rulers like Peisistratos reconciled the mysteries with the interests of the State as a whole by making them a matter of national concern.

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[31] *De Abst.* i. 66.

[32] See Xenophanes, fr. 18 (R. P. 73). But it is not quite certain that Xenophanes is here referring to Pythagoras.

Aristoxenos' version of the events which led to the downfall of the Pythagorean Order is given at length by Iamblichos. According to this, Kylon was a prominent and powerful citizen, whom Pythagoras had declined to receive into the society. He therefore became a bitter foe of the Order, and from this cause Pythagoras removed from Kroton to Metapontion, where he died. The

Pythagoreans, however, still retained possession of the government of Kroton, till at last the partisans of Kylon set fire to Milo's house, where they were assembled. Of those in the house only two, Archippos and Lysis, escaped. The rest of the story is somewhat confused in the report of Iamblichos; but, if we adopt the highly probable interpretation of Rohde,[33] it can be made out well enough. Archippos retired to Taras; Lysis, first to Taras and then to Thebes, where he became later on the teacher of Epameinondas. The Pythagoreans who remained concentrated themselves at Rhegion; but, as things went from bad to worse, they all left Italy except Archytas, and went to Hellas, where they remained till the final extinction of the school.[34]

This account has all the air of being historical, and agrees very well with what we otherwise know. Of course the merely personal motives ascribed to Kylon involve a suppression of the truth which is probably deliberate; but, on the whole, we may accept the story as a fair statement of what occurred. The mention of Lysis proves that these events were spread over more than one generation. The *coup d'état* of Kroton cannot have occurred before 450 B.C., if the teacher of Epameinondas (*b. circa* 420 B.C.) escaped from it, and it may have occurred even later. But it must have been before 410 that the Pythagoreans left Rhegion for Hellas; Philolaos was certainly at Thebes about that time.

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[33] *Rhein. Mus.* xxvi. p. 565, *n.* 1.

[34] The narrative in the text (Iambl. *V. Pyth.* 250; R. P. 49*b*) goes back to Aristoxenos and Dikaiarchos (R. P. 49*a*). There is no reason to suppose that their erroneous view of Pythagoras has vitiated their account of what must have been a perfectly well-known piece of history. According to the later story, Pythagoras himself was burned to death in the house of Milo, along with his disciples. This is merely a dramatic compression of the whole series of events into a single scene; we have seen that Pythagoras died at Metapontion before the final catastrophe. The valuable reference in Polybios, ii. 39 (R. P. 49), to the burning of Pythagorean συνέδρια certainly implies that the disturbances went on for a very considerable time.

The political power of the Pythagoreans was now gone for ever, and no doubt this was a very good thing for the Italian cities. It was even better, however, for the Pythagoreans themselves; for it led them to drop the merely magical and superstitious parts of their system, and enabled them to take their place as one of the scientific schools of Hellas. We shall have to consider them in this light later on; it would be an anachronism to introduce their numerical philosophy here.

Want of evidence as to the teaching of Pythagoras.

37. Of the opinions of Pythagoras we know even less than of his life. Aristotle clearly knew nothing either of ethical or of physical doctrines going back to the founder of the society himself.[35] Aristoxenos only gave a string

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[35] When discussing the Pythagorean system, Aristotle always refers it to "the Pythagoreans," not to Pythagoras himself. That this was intentional seems to be proved by the curious phrase: *οἱ περὶ τὴν Ἰταλίαν, καλούμενοι δὲ Πυθαγόρειοι* (*De Cœlo*, B, 13. 293*a*, 20). Pythagoras himself is only thrice mentioned in the whole Aristotelian corpus. In only one of these places (MM. 1182*a*, 11) is any philosophical doctrine ascribed to him. We are told there that he was the first to discuss the subject of goodness, and that he made the mistake of identifying its various forms with numbers. But this is just one of the things which prove the late date of the *Magna Moralia*. In *Rhet.* B, 23. 1398*b*, 14, we are told that Alkidamas cited the fact of the honours paid by the Italiots to the memory of Pythagoras to show that all men honour the wise. But this does not imply that he was a philosopher; for the *σοφοί* with whom he is associated are Archilochos, Sappho, Chilon, Anaxagoras, Solon, and Lykourgos. Lastly, in the *Metaphysics* (A, 5. 986*a*, 29) we have the statement that Alkmaion (§ 79) flourished in the old age of Pythagoras. As this occurs in the middle of a discussion of the Pythagorean philosophy, it might be thought to imply that Pythagoras himself originated that philosophy. But, in the first place, the statement is omitted in the best MS. (A^b), and is not commented upon by Alexander. In the second place, the purpose of the statement, even if genuine, is merely to justify the doubts expressed by Aristotle as to the relation between Alkmaion

of moral precepts.[36] Dikaiarchos is quoted by Porphyry as asserting that hardly anything of what Pythagoras taught his disciples was known except the doctrine of metempsychosis, the periodic cycle, and the kinship of all living creatures.[37] The fact is, that, like all teachers who introduce a new way of living rather than a new view of the world, Pythagoras preferred oral instruction to the dissemination of his opinions by writing. We are told quite distinctly that there were no Pythagorean writings of any kind till the time of Philolaos. All that has come down to us under the names of the various disciples of Pythagoras is pure forgery, of the most worthless kind.[38] The whole early history of Pythagoreanism is therefore conjectural, and all we really know about the later views of the school is what we are told by Aristotle. It will be seen, however, that we do learn a good deal from that source, and it is possible to draw thence a few inferences as to the earlier forms of the doctrine. We may therefore make an attempt to understand, in a very general way, what the position of Pythagoras in the history of Greek thought must have been.

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and the Pythagoreans. In fact, it really tells strongly against the view that the Pythagorean system originated with Pythagoras. Had it done so, how could Aristotle suppose that part of it may have been borrowed from Alkmaion, who was at least a little later in date?. It is worthy of notice also that Aristotle (*Met.* A, 5. 985*b*, 23) speaks of the Pythagoreans as "*contemporary with* and earlier than" Empedokles, Anaxagoras, Leukippos, and Demokritos (ἐν δὲ τούτοις καὶ πρὸ τούτων).

[36] The fragments of the Πυθαγορικαὶ ἀποφάσεις of Aristoxenos are given by Muller, F. H. G. ii. p. 272 sqq.

[37] *V. Pyth.* 19 (R. P. 46).

[38] Porph. *Schol. Br.* 7*b* (R. P. 50*b*). It was not till the first century B.C. that Pythagorean writings began to be manufactured in considerable numbers. See Diels, *Dox.* p. 150, and *Ein gefälschtes Pythagorasbuch*, in *Arch.* iii. p. 451 sqq. Cf. also Bernays, *Die Heraklitischen Briefe*, *n.* 1.

"Transmigration."

38. In the first place, then, there can hardly be any question that he really taught the doctrine of transmigration. Herodotos, as we have seen, brings him into connexion with Salmoxis, doubtless on this very ground. The belief in metempsychosis is most easily explained as an inference from the primitive theory of a kinship between men and beasts. We have just seen that Pythagoras certainly held this view,[39] which is associated among savage tribes with a system of taboos upon certain kinds of food. If we find that the Pythagorean doctrine of transmigration was, as a matter of fact, inseparably bound up with restrictions of precisely the same nature, this will go far to show that it had its origin in the same primitive ideas, and that it was really due to something like the savage idea, a revival of which would be quite intelligible in connexion with the foundation of an artificial religious community. Now, that the Pythagorean rule really was an elaborate system of taboos is well known. The most familiar of these is that upon beans, but the abstinence from animal sacrifices and the use of wool belong to the same class of observances.

It has, indeed, been doubted by some whether we have any right to accept as historical what we are told by such late writers as Porphyry on the subject of Pythagorean abstinence from animal flesh and beans. Aristoxenos, whom we have admitted to be one of our oldest sources of information, may be cited to prove that the original Pythagoreans knew nothing of these restrictions. He undoubtedly said[40] that Pythagoras did not abstain from animal food in general, but only from the flesh of the ploughing ox and the ram. He also said that Pythagoras preferred beans to every other vegetable, as being the most laxative. Aristoxenos, however, is a witness who very often breaks down under cross-examination, and he usually wrote with some purpose quite different from the mere truthful record of facts. It is necessary, then, to ask why he takes the trouble to make these assertions at all. Now the palpable exaggeration of his statement about beans shows that he is endeavouring to combat what was a deeply-rooted opinion in his own time, and we are therefore able to show, out of his own mouth, that the tradition which made the Pythagoreans abstain from animal flesh and beans already existed long before there were any Neopythagoreans interested in maintaining such an idea. Still, it may be asked what motive Aristoxenos could have had for denying the common belief. The answer is simple and instructive. He had been the friend of the last of the Pythagoreans; and, in their time, the merely superstitious part of Pythagoreanism had been dropped, except by some zealots whom the heads of the society refused to acknowledge. It was natural, then, that they should wish to forget the original practices of their Order, and Aristoxenos was always ready to lend himself to any fraud, pious or otherwise. And now we see how it is that he represents Pythagoras himself in so different a way from both the older and the later traditions; it is because he gives us the view of the more enlightened sect of the Order. Those who clung faithfully to the old practices were now regarded as heretics, and all manner of theories were set on foot to account for their existence. It was related, for instance, that they descended from one of the "Akousmatics," who had never been initiated into the deeper mysteries of the

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[39] See *n.* 37.

[40] Fr. 7.

"Mathematicians."[41] All this, however, is pure invention. The satire of the poets of the Middle Comedy proves clearly enough that, even though the friends of Aristoxenos did not practise abstinence, there were plenty of people in the fourth century, calling themselves Pythagoreans, who did.[42] These we regard as the representatives of the original customs of the sect.

We know, then, that Pythagoras taught the kinship of beasts and men, and we infer that his rule of abstinence from flesh was based, not upon either humanitarian or ascetic grounds, but simply on taboo. This is strikingly confirmed by a fact which we are told in Porphyry's *Defence of Abstinence*. The statement in question does not indeed go back to Theophrastos, as so much of Porphyry's tract certainly does;[43] but it is, in all probability, due to Herakleides of Pontos.[44] It is to the effect that, though the Pythagoreans did as a rule abstain from flesh, they nevertheless ate it when they sacrificed to the gods.[45] Now, among savage peoples, we constantly find that the sacred animal is slain and eaten sacramentally by its kinsmen on certain solemn occasions, though in ordinary circumstances this would be the greatest of all impieties. Here, again, we have to do with a very primitive belief; and we need not therefore attach any weight to the denials of Aristoxenos.[46]

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[41] The sect of the "Akousmatics" were said to descend from Hippasos (Iambl. *V. Pyth.* 81; R. P. 47). Now Hippasos was the author of a μυστικὸς λόγος (D. L. viii. 7; R. P. 47*e*), that is to say, of a superstitious ceremonial or ritual handbook, probably containing Akousmata like those we are about to consider; for we are told that it was written ἐπὶ διαβολῇ Πυθαγόρου. The Akousmatics had no tradition of mathematical science, and we have seen that the Mathematicians explained this by saying they were originally an inferior class of Pythagorean students, and that Hippasos himself had never been initiated into the higher mysteries. It is simply a case of the very common process by which those who have kept up the original ideas of a sect come to be looked upon as heretics by those who have gone in for "development."

[42] See, for instance, the *Pythagorizousa* of Alexis, fr. 2. History has not been kind to the Akousmatics; but it is probable that they never quite died out, though they may have become partially merged in the Cynic sect. The names of Diodoros of Aspendos and Nigidius Figulus help us to bridge the gulf between them and Apollonios of Tyana.

[43] See Bernays, *Theophrastos' Schrift über Frömmigkeit*. Porphyry's tract, Περὶ ἀποχῆς ἐμψύχων, was doubtless saved from the general destruction of his writings by its conformity to the ascetic tendencies of the age. Even St. Jerome made constant use of it in his polemic against Iovianus, though he is careful not to mention Porphyry's name (*Theophr. Schr.* *n.* 2). The tract is addressed to Castricius Firmus, the disciple and friend of Plotinos, who had fallen away from the strict vegetarianism of the Pythagoreans.

39. We shall now know what to think of the various Pythagorean rules and precepts which have come down to us. These are of two kinds, and have very different sources. Some of them, derived from the collection of Aristoxenos, and for the most part preserved by Iamblichos, are purely moral in character, besides being, on the whole, very dull. They do not pretend to go *Akousmata.*

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[44] "The well-known Herakleides of Herakleia in Pontos, who showed his versatility, now as a strict Platonist of the school, now as a strict Peripatetic, and again as a *litterateur* of no school at all" (Bernays, *Theophr. Schr.* p. 10), wrote a work on the Pythagoreans (D. L. v. 88) in the last of these three capacities.

[45] The passage occurs *De Abst.* p. 58, 25 Nauck.: *ἱστοροῦσι δέ τινες καὶ αὐτοὺς ἅπτεσθαι τῶν ἐμψύχων τοὺς Πυθαγορείους, ὅτε θύοιεν θεοῖς.* The part of the work from which this is taken comes from one Clodius, on whom see Bernays, *Theophr. Schr.* p. 11. He was probably the rhetorician Sextus Clodius, and a contemporary of Cicero. Bernays has shown that he made use of the work of Herakleides of Pontos (*ib. n.* 19). On "mystic sacrifice" generally, see Robertson Smith, *Rel. Sem.* i. p. 276.

[46] Porphyry (*V. Pyth.* c. 15) has preserved a tradition to the effect that Pythagoras recommended a flesh diet for athletes (Milo?). This story must have originated at the same time as those related by Aristoxenos, and in a similar way. In fact, Bernays has shown that it comes from Herakleides of Pontos (*Theophr. Schr. n.* 8). Iamblichos (*V. Pyth.* 5. 25) and others (D. L. viii. 13. 47) got out of this by supposing it referred to a gymnast of the same name. We see here very distinctly how the Neoplatonists for their own ends endeavoured to go back to the original form of the Pythagorean legend, and to explain away the fourth century reconstruction.

back to Pythagoras himself; they are merely the sayings which the last generation of "Mathematicians" heard from their predecessors. The second class is of a very different nature, and the sayings which belong to it are called *Akousmata*,[47] which points to their being the property of that sect of Pythagoreans which had faithfully preserved the old customs. A good many of these are quoted by Plutarch, who interprets them as "symbols" of moral truth, though his interpretations are very far-fetched indeed, and it does not require a very practised eye to see that they are genuine taboos of a thoroughly primitive type. I give a few examples in order that the reader may judge what the famous Pythagorean rule of life was really like. The numbers are those of Orelli:—

1. Not to sit on a quart-measure.
2. Not to step across the beam of a balance.
4. Not to eat the heart.
5. To abstain from beans.
6. Not to taste black-tails (a kind of fish).
7. Not to let swallows share one's roof.
8. Not to stir the fire with iron.
9. Not to put bread in a pot.
10. When the pot is taken off the fire, not to leave the mark of it in the ashes, but to stir them together.
29. Do not look in a mirror beside a light.
33. When you rise from the bedclothes, roll them together and smooth out the impress of the body.

If this last rule were not observed, some evil-disposed person might stick pins in the impress! It is much to be wished that some competent anthropologist would edit these curious remains, and collect the savage parallels.

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[47] These are given in a convenient form by Orelli, *Opusc. Græc. Sentent.* p. 60 sqq.

Further examples of the close relation between Pythagorean and savage modes of thought might easily be given; but these are probably enough to justify our general view. The kinship of men and beasts, the abstinence from flesh, and the doctrine of metempsychosis all hang together, and form a perfectly intelligible whole for any one who has bestowed the slightest attention on the mental habits of primitive men everywhere.

Scientific teaching.

40. Were this all we knew of Pythagoras, we should be tempted to delete his name from the history of philosophy altogether, and to relegate him, with Epimenides and Onomakritos, to the class of medicine-men.[48] We shall see, however, that such a description of him would be quite inadequate. He is a highly ambiguous figure, and cannot be disposed of by any single formula. Herakleitos says[49] that he had pursued the scientific investigation of nature further than any other man. He at once qualifies this, however, by adding that he turned his "much learning" into an "art of mischief."[50] It is clear what Herakleitos means by this "art of mischief." He is expressing the same feeling as was in the mind of the sillographer Timon of Phlious, a sceptical satirist of philosophers who wrote in the third century B.C., when he said that Pythagoras had "fallen away into magical opinions in his hunt for men."[51] Still, it remains true that Herakleitos acknowledges the scientific eminence of Pythagoras, and we must take account of his testimony.

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[48] Called in Greek *γόητες* and *ἀγύρται*.

[49] Fr. 17, Byw. (R. P. 24 A).

[50] I cannot believe that *ἱστορίη* in Herakleitos means anything else than *ἡ περὶ φύσιος ἱστορίη*. The fragment is ably discussed in Diels' paper referred to above, *n.* 38.

[51] Timon, fr. 3 (Wachsmuth, *Sill. gr.* p. 93): Πυθαγόρην τε γόητας *ἀποκλίνοντ' ἐπὶ δόξας θήρῃ ἐπ' ἀνθρώπων, σεμνηγορίης ὀαριστήν.*

Herodotos, too, calls Pythagoras "by no means the weakest sophist of the Hellenes."[52] There is not the slightest disparagement implied in the use of the word "sophist" here; it was, as we shall have occasion to see more than once, the regular word for a scientific man at this date. We infer from all this, then, that Pythagoras must have had a cosmological theory of some sort. What it was can only be guessed; for, though he probably made no secret of it, he did not choose to commit it to writing. But certain recent conjectures on the subject are at once so probable in themselves, and throw so much light upon the development of Greek science, that they cannot be passed over in silence.

Dualism. 41. We know, in the first place, that the Pythagorean philosophy of later times was fundamentally dualist, and it seems probable that this dualism goes back to the founder of the school. It will be shown in the Fourth Chapter that the "Second Part" of the poem of Parmenides is, in all probability, a sketch of the early Pythagorean cosmology, and its details will be discussed from this point of view. Here we shall only take notice of the fact that it expounds a dualistic system as the common opinion of men, and it is hard to see who these "men" can be if they are not the Pythagoreans. Nor could anything be more natural than that a system of this kind should have arisen just at this time. There really was a latent dualism in the strife of opposites upon which Anaximander had insisted, and it was sure to come out somewhere. We know in addition to this that the Pythagoreans of later times held that the two primary opposites, the Limited and the Unlimited, were brought together in a "harmony" which could be numerically determined.[53] Now, if Pythagoras himself believed in a fundamental dualism; and if, as all our authorities testify, he pursued mathematical and musical studies, this theory would naturally present itself to him at once. Besides, the way in which Herakleitos uses this very word "harmony" suggests irresistibly that he already knew of some such view.[54] The statement that Pythagoras was the first to call the world Kosmos is not in itself incredible, and would agree very well with this.[55]

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[52] Herod. iv. 95 (R. P. 41 A).

The world as breathing.

42. There is, lastly, one point of the greatest importance, upon which Tannery, who has done much to clear up the difficulties of Pythagoreanism, rightly insists. Xenophanes, after laying down that the World or God was sentient all over, seems to have thought it worth while to add that it did not breathe.[56] We have seen already that the idea of the world breathing was originated by Anaximenes; but it was also, as we know from Aristotle, the view of the later Pythagoreans that different substances were separated from one another by the "Air"

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[53] See below, Chap. VII. § 119 sqq.

[54] See below, Chap. III. § 61.

[55] It is true that the doxographers ascribe the use of the word to Anaxinander and Anaximenes. The former appears, however, to have said that the ἄπειροι οὐρανοί, not the ἄπειροι κόσμοι, were gods (*supra*, Chap. I. § 17); and this may indicate that the term κόσμος was unknown. It is certain that the use of the word in the sense of "world" did not belong to ordinary speech. In Herakleitos it has not yet this meaning, and even Xenophon speaks of "what the sophists call the *Kosmos*" (*Mem.* i. 1. 11). That being so, we naturally ask who is most likely to have first used the word in this sense. The answer cannot be doubtful. Anaximander regarded the world as a scene of strife and injustice, and would hardly, therefore, have applied to it a word which originally meant the disciplined order of an army. On the other hand, this is quite in accordance with Pythagorean modes of thought.

[56] D. L. ix. 19 (R. P. 86*c*). It is true that Diogenes is here quoting from a wretched biographical compendium (*Dox.* p. 168); but this touch can hardly be a mere invention.

which the world inhales from beyond the heavens.[57] I cannot but assent to Tannery's contention that this is what Xenophanes denied, and he was forced to deny it; for he did not allow, we shall see, that there was anything outside the world at all. Now, if it is admitted that Pythagoras himself originated this theory, we shall have to regard the modification which he made in the Milesian hypothesis somewhat in the following way. Anaximenes had supposed that the world was kept up by draughts of vapour or "air" from outside the heavens. To Pythagoras this air was identical with the space which the geometer studied, and he thought of things as made of space bounded in various ways. The air was, as Anaximenes had said already, "the boundless" or unlimited, and all that Pythagoras required in order to construct a world out of it was something to limit it. This he found, it seems, in Fire.[58] Apparently the light element was supposed to contain a principle of limit as opposed to the unlimited darkness, and we thus come very near the idea of the world as built up of geometrical figures, an idea characteristic of the later Pythagorean philosophy.

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[57] The most important passages are quoted in R. P. 63*b*, *c*, *d*. See also the article *Zu Pythagoras und Anaximenes*, by Alessandro Chiapelli, in *Archiv*. i. p. 582 sqq. This does not convince me, however, that Anaximenes was influenced by Pythagoras. I have shown above (Chap. I. § 25) that the apparent return of Anaximenes to a position resembling that of Thales can be abundantly justified, and it will be seen later on that the statement of Theophrastos connecting Anaxagoras with Anaximenes can be explained without adopting a later date for the latter than that given by Apollodoros. (See Chap. VI. § 98 and *n*. 11-14.)

[58] Such, at least, is the theory expounded by Parmenides (Chap. IV. § 77). Note the importance in this connexion of Aristotle's statement that Hippasos made fire the first principle (R. P. 47*e*). If we are right in regarding him as the representative of the earliest form of Pythagoreanism, this becomes very significant. It also suggests, like the use of the word Harmony, a possible connexion between Pythagoras and the theory of Herakleitos.

All this is, as has been said, a hypothesis, which can only be justified on the ground that it explains and harmonises with what we otherwise know. That it does so, to a remarkable degree, will be evident when we come to study the polemic of Parmenides and subsequent cosmologists. Till then, it can only appear more or less plausible; but we shall have occasion to come back more than once to every one of the points just mentioned; and, at the close of our discussion, it will be seen that the theory advanced has as high a degree of probability as the nature of the case will allow.

II. XENOPHANES.

Life.

43. We have seen how the breach of Pythagoras with the public religion of his time issued in a return to more primitive observances and beliefs; we have now to consider a very different manifestation of the same dissatisfaction with the theology expounded by the poets. Xenophanes of Kolophon denied the ordinary conception of the gods altogether. His bitter hostility to common religious observances, and still more to the stories which the poets had extracted from them, may, perhaps, be in part accounted for by the fact that he belonged originally to a region where the popular cults were more than usually cruel and obscene. The cities in the basin of the Kayster were inhabited by a very mixed population indeed, and there is abundant evidence that the native Asiatic element was very strong in them.[59] Ephesos

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[59] Herodotos tells us that Ephesos and Kolophon did not celebrate the Ionic feast of the Apatouria (i. 147), and we know from inscriptions that

was the headquarters of the worship of the Great Mother, whom the Greeks identified with Artemis. This goddess was apparently a survival from the days of polyandry, and her worship was, therefore, most impure. The close vicinity of a cult of this nature may well have helped to disgust the young Xenophanes with religion altogether.

According to Timaios of Tauromenion, who paid great attention to chronology, Xenophanes of Kolophon, son of Orthomenes, was a contemporary of Hieron and Epicharmos.[60] Hieron reigned at Syracuse from 478 to 467 B.C., and Epicharmos is said to have "flourished" in 486. Clement of Alexandria and Sextus Empiricus both say, however, that Apollodoros gave Ol. XL. (= 620 B.C.) as the year of Xenophanes' birth.[61] Obviously this is impossible, and Diels has made it probable that Apollodoros said nothing of the sort.[62] In effect, Diogenes Laertios, who usually follows Apollodoros in such matters, says that Xenophanes flourished in Ol. LX. (= 540 B.C.),[63] or, in other words, just about the time that Elea was founded by the Phokaian refugees. This was a natural date to fix upon for the reputed founder of the Eleatic School; but, nevertheless, it seems to be too early by several years. Xenophanes cannot well have been forty years old in 540 B.C.; for he tells us himself that he was only twenty-five when he left his home, and that can hardly have been before 546. He says (fr. 24; R. P. 80):—

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they each contained a number of tribes in addition to the four Ionic ones (Busolt, *Gr. Gesch.* i. p. 216).

[60] Ap. Clem. *Strom.* i. p. 353, Potter (R. P. 79 A).

[61] Clem. *loc. cit.;* Sext. *Math.* i. 257.

[62] *Rhein. Mus.* xxxi. 22. Cf. R. P. 79*b*.

[63] D. L. ix. 20.

> There are by this time threescore years and seven that have tossed my careworn soul[64] up and down the land of Hellas; and there were then five and twenty years from my birth, if I can say aught truly about these matters.

Indeed, it would almost seem as if this utterance were an answer to the question asked in another poem[65] (fr. 17; R. P. 79*a*):—

> This is the sort of thing we should say by the fireside in the winter-time, as we lie on soft couches, after a good meal, drinking sweet wine and crunching nuts: "Of what country are you, and how old are you, good sir? And how old were you when the Mede appeared?"

Xenophanes, then, was not born before 571 B.C.—that is, nearly forty years after Anaximander, who, according to Theophrastos, was his teacher.[66] He must have lived on at least till 479 B.C., the year in which the Mede was driven from Ionia once more.[67] It is obvious that this is quite consistent with the statement that he was contemporary with Hieron and Epicharmos, and with the still more important fact that he is referred to by Herakleitos in the past tense.[68]

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[64] According to Bergk (*Lyrik.* ii. 418*n*, 23), φροντίς means a literary product, like the Latin *cura*. It is true, no doubt, that it cannot be simply equivalent to φρένα, but may it not mean either (1) a life of artistic production, or (2) a life of trouble?

[65] It must have been another poem; for fr. 19 is in elegiacs, fr. 17 in hexameters.

[66] D. L. ix. 21 (R. P. 91). The word τοῦτον refers to Xenophanes, and it is not necessary to make any change in the text (*Dox.* p. 103). Cf. also the statement of Sotion, that Xenophanes was contemporary with Anaximander (D. L. ix. 18; R. P. 78 B), which is no doubt a misunderstanding of this.

[67] Clement (R. P. 79 A) quotes Apollodoros as saying that he lived till the times of Dareios and Cyrus. It is hardly enough to suppose, with Diels (R. P. 79*c*), that the names are inverted on metrical grounds. Why should Cyrus be mentioned at all? At first sight it would seem more likely that Clement misread Cyrus for Xerxes; but Hippolytus (*Ref.* i. 14) has ἕως Κύρου διέμεινεν. There is clearly some hopeless confusion.

When driven from his home, Xenophanes is said to have made his living by reciting his compositions in Sicily, chiefly, we are told, at Zankle and Katana.[69] It is not likely that he ever settled at Elea, as is said by some modern writers.[70] The anecdote related of Xenophanes by Aristotle in his *Rhetoric* implies, perhaps, that he visited that city, but nothing more. In fr. 24 he seems to say that he was still leading a vagrant life in his ninety-second year. There is therefore no reason to believe that he founded the school of Elea, though it is quite likely that Parmenides was to some extent influenced by him.[71]

Xenophanes a satirist.

44. It is most important for a proper appreciation of the teaching of Xenophanes to realise that he was not, strictly speaking, a philosopher, but simply a satirist who had sat, more or less, at the feet of Anaximander. He is almost equally zealous for the reformation of the usages of the dinner-table and for that of religion. The

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[68] Fr. 16, Byw. (R. P. 24).

[69] D. L. ix. 18 (R. P. 79 B and 80). The use of the old name Zankle instead of the later Messana seems to show that this is an old tradition.

[70] It is nowhere expressly stated by any ancient writer that Xenophanes ever was at Elea. The reference in Plato (*Soph.* 242 D), where the Ἐλεατικὸν ἔθνος is said to start from him, does not mean this, as is shown by the words καὶ ἔτι πρόσθεν, which probably refer to the Ionian philosophers. It is to be feared that the notice as to the poems on the founding of Kolophon and the colonisation of Elea is a lie of Lobon's (Hiller, *Rhein. Mus.* xxxiii. 529). He gave stichometric notices of all the Seven Wise Men and also of Epimenides, etc. Notices of this sort have therefore no value, unless it can be shown that they probably came from the *Pinakes* of Kallimachos, through some such writer as Hermippos.

[71] For the story referred to, see *Rhet.* B, 24. 1400*b*, 5 (R. P. 81*a*). Arist. *Met.* A, 5, only says that Parmenides "is said" to have been the disciple of Xenophanes. This weakens the force of the doxographical tradition that he was his "successor" (*Theophr.* ap. R. P. 91*a*, etc.).

guests must not drink so much that they cannot get home without a servant, nor must the conversation turn upon the silly old tales of Titans, Giants, and Centaurs. It must be free alike from discourteous abuse and trifling arguments (fr. 21). He is also a great foe to the exaggerated estimate of athletic prowess which, as we may gather from Pindar, prevailed in Sicily under the Hieronic *régime*. Why should a city rejoice at an Olympic victory more than at anything else? It is not that which will fill its warehouses or improve its laws (fr. 19). Xenophanes was, in fact, a typical Ionian; and therefore the combination of one-sided athleticism and effeminate luxury, so characteristic of Western Hellas, would be peculiarly distasteful to him. He has also, it is true, something to say of the luxurious ways his own countrymen had learnt from the Lydians (fr. 20); but, on the whole, he is chiefly, I take it, to be regarded as a satirist who set himself to laugh the Western Greeks out of their coarse habits and ideas, and to stir them up to emulation of the refinement which had been so well understood in the cities of Asia Minor. Now a complete emancipation from merely traditional views of the world was beyond doubt one of the chief elements in that refinement, and for this reason it was a necessary part of the task which he set before himself to expose the weaknesses of the popular religion. For the rest, he was not content to expound the ideas of Anaximander, without, as we shall see, making several alterations in them, which followed directly from his polemic against the common idea of the gods.

45. Xenophanes is said by Diogenes, who doubtless follows the Alexandrian librarians, to have written hexameters, elegiacs, and iambics against Homer and **Writings.**

Hesiod.[72] All the fragments which deal with God or the world are in hexameters, though it by no means follows that he composed a single poem on this subject. Only late writers speak of a Poem on Nature;[73] and it is quite possible that, like Epicharmos, Xenophanes expounded his philosophical views incidentally in the course of his satirical compositions. The elegiacs were of the didactic kind common at this period, as we see from the specimens that have survived. As to the iambics, it is difficult to be certain. There is only one very doubtful example (fr. 25), and the attack on Homer and Hesiod which has come down to us (fr. 7) is in hexameters. But there is nothing improbable in the statement that Xenophanes also abused the anthropomorphic poets in what was the recognised metre for all abuse. The assertion that he wrote *Silloi* has probably no more solid foundation than the fact that the sillographer Timon of Phlious (*flor.* c. 279 B.C.) put some of his satire upon philosophers into the mouth of Xenophanes.[74]

The complete text of the poems of Xenophanes seems to have been very early lost. Simplicius says quite distinctly that he had never met with them, and probably they had disappeared long before his time.[75] Our fragments are therefore very scanty, and sometimes their context is obscure. I give those which are important for the cosmology according to Karsten's arrangement, noting all departures from his text, except where these are adopted and noted in the seventh edition of Ritter and Preller—

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[72] D. L. ix. 18 (R. P. 80).

[73] A poem περὶ φύσεως is referred to by Aetios (i. 3. 12) in quoting a wholly imaginary fragment (fr. 8). Cf. also Pollux, vi. 46.

[74] See Wachsmuth, *Sillographorum Græcorum Reliquiæ* [1885], p. 55 sqq. That Xenophanes wrote *Silloi* is stated by Strabo (*Geog.* xiv. 1. 28 ; R. P. 80*b*) and many other late writers. But this does not prove that he himself called any of his poems by that name.

[75] Simpl. *De Cælo*, ap. *Schol. Br.* 506*a*, 40 (R. P. 80*b*). The recovery of fr. 11 from the Geneva Scholia (*n.* 78) perhaps shows that the poem existed in the days of Krates of Mallos (*c.* 167 B.C.).

(1.) There is one god, the greatest among gods and men, neither in form nor thought like unto mortals. R. P. 83.

(2.) He sees all over, thinks all over, and hears all over. R. P. 85.

(3.) But without toil he sways[76] all things by the thought of his mind. R. P. 89*b*.

(4.) And he abideth ever in the same place, moving not at all; nor doth it befit him to go about, now hither, now thither. R. P. 90 D.

(5.) But mortals think that the gods are born as they are, and have perception[77] like theirs, and voice and form. R. P. 83.

(6.) Yes, and if oxen or lions had hands, and could paint with their hands and produce works of art as men do, horses would paint the forms of the gods like horses, and oxen like oxen. Each would represent them with bodies according to the form of each. R. P. 83.

(6*a*.) So the Ethiopians make their gods black and snub-nosed; the Thracians give theirs red hair and blue eyes. R. P. 83*a*.

(7.) Homer and Hesiod have ascribed to the gods all things that are a shame and a disgrace among men, thefts and adulteries and deception of one another. R. P. 82.

(9.) For we all arise from earth and water. R. P. 86.

(10.) All things are earth and water that come into being and grow. R. P. 86.

(11.) The sea is the source of water and the source of wind; for neither would the blasts of winds arise in the clouds and blow forth from within them without the mighty sea, nor the rivers' streams nor the rain-water in the sky. But the mighty sea is the father of clouds and winds and rivers.[78]

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[76] Reading *κρατύνει* with Freudenthal.

[77] With Zeller (p. 490, *n.* 1; Eng. trans. i. p. 560, *n.* 1), I prefer Theodoret's *αἴσθησιν* to the *ἐσθῆτά τ'* of Clement and Eusebios. It gives a better antithesis to fr. 1 and 2.

(12.) This limit of the earth above is seen at our feet; but below its roots[79] stretch to infinity. R. P. 86.

(13.) She that they call Iris is a cloud likewise, purple, scarlet, and green to behold. R. P. 86.

(14.) There never was nor will be a man who has clear certainty as to what I say about the gods and about all things; for, even if he does chance to say what is right, yet he himself does not know that it is so. But all are free to guess. R. P. 87.

(15.) These are guesses something like the truth. R. P. 87*a*.

(16.) The gods have not shown forth all things to men from the beginning, but by seeking they gradually find out what is better. R. P. 87*b*.

The One.

46. Let us see, in the first place, what can be made of the statements with regard to what Xenophanes called the One and All, and the greatest god. The following passage of Simplicius is the first thing that claims our attention:—

> Xenophanes said that the first principle was one, or that being was one and all, neither finite nor infinite, neither in motion nor at rest. (*This is a mistake derived from the treatise on "Melissos, Xenophanes, and Gorgias," which Simplicius supposed to be the work of Theophrastos.*) Theophrastos admits that the mention of this view belongs rather to another inquiry than to that into nature; for Xenophanes identifies this One and All with God. . . . (*Here follow certain erroneous views from MXG.*) . . . But Nicolas of Damascus notes, in his Treatise on the Gods, that Xenophanes affirmed his first

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[78] Fr. 11 has just been recovered in its entirety from the Genevese Scholia on Homer. See *Arch.* iv. 652, and Chap. IX. *n.* 7.

[79] I have restored the original metaphor from Aristotle (R. P. 86*b*); what Achilles gives is a mere paraphrase. For the "roots of the earth," cf. Hesiod, *Works and Days*, 19. I have not attempted to translate or amend the corrupt καὶ ῥεῖ προσπλάζων.

principle to be infinite and immovable. Alexander, however, says he made it finite and spherical, because of its equality in every direction. Simpl. *Phys.* p. 22 D (R. P. 88 B and 90 D).

It is clear that Simplicius is completely at a loss. He finds in Alexander certain statements which seemed to come from Theophrastos; but cannot possibly be reconciled with those of the *Melissos, Xenophanes, and Gorgias,* which he believed to be also the work of Theophrastos.[80] Alexander said that the One of Xenophanes was finite, and the other source declared that it was neither finite nor infinite. Lastly, to make matters worse, Nicolas of Damascus affirmed that it was infinite. Is it possible for us to get at the truth of the matter?

In the first place, we must, of course, discard the statement that the One was neither finite nor infinite. The source from which it comes is worthless as evidence for Xenophanes. In the second place, we must admit that, according to Theophrastos, the One of Xenophanes was finite, and that Alexander of Aphrodisias gave a perfectly true report of what he said.[81] But, on the other hand, we must insist that the fragments do not in any way justify such a statement, and that fr. 12, especially, is quite inconsistent with it. Now, we gather from the report of Alexander, as given by Simplicius, that the reason alleged by Theophrastos for his statement that Xenophanes held the All to be finite and spherical was that he had said it was "equal in every direction"; and there can be no doubt that he actually did say this. Not only Hippolytos, but also a much older authority, namely, the sillographer Timon of Phlious, bears witness to it.[82] If we had to allow that this implies the finiteness and sphericity of the All, we should undoubtedly be forced to accept the statement of Theophrastos; but there is another course open to us. The fact is, that the term "infinite" was not used with any precision before the time of Zeno, and it cannot surely be doubted that Xenophanes might have spoken of the "boundless" All which, nevertheless, was "equal in every direction." If he did so, the statement of Theophrastos is sufficiently accounted for, and we are not bound to try to find room for an infinite earth and an infinite æther within a finite universe. And, if we understand the well-known reference of Aristotle to Xenophanes as Zeller does, the question is really settled by it. In the First Book of the *Metaphysics* we read that, while Parmenides made the One finite and Melissos made it infinite, "Xenophanes did not explain himself at all, and does not seem to have laid hold of either nature (*i.e.* finitude or infinity), but said, with reference to the whole universe" (for surely

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[80] For a clear statement of the present state of the question as to M. X. G., see R. P. 88. The suggestion made long ago by Bergk, in his *Litteraturgeschichte* (ii. 418), does not seem, however, to have received as yet the attention which it deserves. Why, indeed, should the arguments of Xenophanes have been foisted in between those of Melissos and Zeno? Is it not more likely, as Bergk supposes, that we have in M. X. G. the end of a Peripatetic treatise dealing with the whole Eleatic School, and that it was originally preceded by an account of Zeno, Parmenides, and perhaps of Xenophanes? This would account for the ambiguity of its title, and for many other things besides. Of course Simplicius, who took the whole for a work of Theophrastos, supposed the central part to deal with Xenophanes; but we have his own confession that he was unacquainted with the original (R. P. 80*b*). See, too, Z.^{5}, p. 500 sqq.

[81] This follows from a comparison of the doxographers. See Diels, *Dox. Prol.* pp. 108, 112, 113, 140, and the commentary on the passages there referred to. I do not think it necessary to suppose with Tannery (*Science hellène*, p. 135) that the statement in M. X. G. is an attempt to reconcile

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the contradiction between Theophrastos and Nicolas. It is quite likely that a later Eleatic philosopher, coming after Zeno, by whom the antinomies of the notion of infinity were first worked out, should have taken up the position there described.

[82] Hipp. *Ref.* i. 14, Timon, p. 148 W (R. P. 85*a*).

the words mean only this, and not "looking up to the vault of heaven"), "that the One was God." This seems to indicate that, while Aristotle found in the poem of Xenophanes the statement that the earth stretched downwards to infinity,—he quotes it himself,—he also found certain expressions which to him implied that the One was finite. He knew also that the One was the world, and he therefore concluded, very naturally, that Xenophanes had not specially considered the subject at all, and that he was himself unaware of the contradiction involved in his statements. This, however, is almost incredible. We can easily allow for a good many inconsistencies and contradictions in a writer of the stamp of Xenophanes, but this would really be too glaring even for him. We conclude, then, that he did in fact ascribe to the world the boundlessness which Anaximander had confined to the primary substance, and it follows from this that he also denied any plurality of co-existing worlds. Now, it will be remembered that Anaximander had held that the "innumerable worlds" were gods, and this brings us face to face with the very difficult question of the supposed monotheism of Xenophanes.

Was Xenophanes a monotheist?

47. If there was one thing upon which all historians of Greek philosophy were agreed, it was that Xenophanes taught a pure monotheism in opposition to popular anthropomorphic polytheism. This has lately, however, been called in question by J. Freudenthal, and he has at least shown that the point demands a much more careful examination than it has usually received. We must not draw hasty conclusions from the fact that the first words of fr. 1 happen to be "One god." Indeed, if we read on with any attention, we come at once to a very surprising phrase; and Freudenthal, in fact, contends that this line,

which is commonly quoted as a declaration of monotheistic belief, is really just the opposite. To say that there is "one god, the greatest *among gods* and men," is not to preach monotheism, but to make open confession of polytheism;[83] and "gods" are similarly recognised by Xenophanes in several places.[84] Further, if we set aside, as of no authority, the *Melissos, Xenophanes, and Gorgias,* there is no ancient writer who expressly and unambiguously credits Xenophanes with a belief in one god only, while there are several who speak of his belief in "gods."[85] Freudenthal concludes, accordingly, that, while Xenophanes identified the world or the All with his "greatest god," he allowed besides a number of "departmental gods"—earth, water, Eros, and the like.

This view has not met with the assent of Zeller and Diels. The latter, indeed, makes the important admission that the entire development of the idea of god among the Greeks tends in the direction of the view unfolded by Freudenthal with so much acuteness and learning. Indeed, monotheism in the fifth century B.C. would be something of an anachronism. He feels, however, a serious difficulty in accepting it, and points especially to the statement of Aristotle, that "Xenophanes, who was the first of all these (*i.e.* the Eleatics) to regard all things as One (for Parmenides is said to have been his disciple) . . . asserted,

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[83] Franz Kern felt this so strongly that he proposed to regard fr. 1 as belonging to a time before Xenophanes had clearly formulated his monotheistic views (*Beitr. zur Darstellung der Philosopheme des X.* p. 4, *n.* 2). But we must not press a proverbial formula too hard.

[84] Freudenthal holds that fr. 14, 16, 21 can have no meaning except in the mouth of a polytheist (*Th. d. X.* p. 8).

[85] Arist. *Rhet.* B, 23. 1399*b*, 6 (R. P. 81), and Cicero, *De Div.* i. 5 (after Poseidonios): *Colophonius Xenophanes unus qui deos esse diceret divinationem funditus sustulit.* But these passages do not really imply polytheism, Z.^{5} p. 532, *n.* 2.

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with reference to the whole universe, that the One was god.[86] Zeller is even more uncompromising,[87] and insists chiefly upon an extract from Theophrastos in the pseudo-Plutarchean *Stromateis*, to the effect that "Xenophanes lays down as to the gods that there is no leadership[88] among them; for it is impious to suppose that any of the gods is under a master, and no one of them stands in need of anything whatsoever."[89] It is clear, he says, that if this is so, the "greatest of the gods" must be the only god. We must allow, I think, that Zeller is right as against Freudenthal in his interpretation of this passage. The latter will have it, that it only excludes a "despotic" government of the gods by the greatest among them; but this can hardly be maintained.[90] It is another question whether it is not merely part of the polemic against anthropomorphic gods, that is, according to Greek ideas, against gods in any real sense whatever. Xenophanes might, perhaps, have as little objection to calling the parts of the world gods as he had to calling the whole world god, provided always that the word was taken in a non-natural sense. I shall come back to this point presently, but first I should like to make one suggestion. Is it quite certain that the statement of the *Stromateis* does not come from the *Melissos, Xenophanes, and Gorgias?*[91] We know that Simplicius took this for the work of Theophrastos; may not the pseudo-Plutarch or his source have done the same? With regard to the passage of Aristotle, it is perhaps enough to remark that it is not the same thing to say that the One is god, as to say that God is one. Lastly, if there is no evidence for the polytheism of Xenophanes, there is just as little for his monotheism.

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[86] *Met.* A, 5. 986*b*, 20 (R. P. 84). It is worth while noting that in *Arch.* i. 99, *n.* 1, Diels retracts the doubts which he had expressed in *Dox.* pp. 110, 111, with regard to the genuineness of this passage. These were based upon the un-Aristotelian vocabulary and style. He has, however, shown, in his interesting paper in *Arch.* i. p. 494 sqq., that Aristotle designedly used a different style in those popular and introductory parts of his writings which were addressed to a public brought up on Plato and Isokrates. This accounts sufficiently for the peculiarities of the present passage.

[87] Freudenthal's work, *Die Theologie des Xenophanes*, was reviewed by Zeller in the *Deutsche Litteraturzeitung* for 1886, p. 1595 sqq. and by Diels in *Arch.* i. p. 97. To these criticisms Freudenthal replied in *Arch.* i. p. 322 sqq. Lastly, Zeller refuted his interpretation of the passage from the *Stromateis* in *Arch.* ii. p. 1 sqq.

[88] Can this be reconciled with fr. 1?

[89] Plut. *Strom.* fr. 4; *Dox.* p. 580: *ἀποφαίνεται δὲ καὶ περὶ θεῶν ὡς οὐδεμιᾶς ἡγεμονίας ἐν αὐτοῖς οὔσης· οὐ γὰρ ὅσιον δεσπόζεσθαί τινα τῶν θεῶν· ἐπιδεῖσθαί τε μηδένος αὐτῶν μηδένα μηδ' ὅλως.*

[90] *Arch.* i. p. 338 sqq.

God and the world.

48. There is, I believe, one way of explaining these difficulties which does justice alike to the weighty arguments of Freudenthal and the objections of Zeller and Diels. We must evidently start from the fact that Xenophanes was chiefly interested in the overthrow of the anthropomorphic religion of the poets. It is also clear that he would most naturally look for arms with which to combat this in the teaching of the Milesian School which had influenced his youth. If, then, we can show that his theory is just such a modification of Anaximander's as we might expect to find under the circumstances, we shall be entitled to believe that we have found what we may call its true centre of gravity. The view of Anaximander was, we have seen, that the innumerable worlds, which come into being and pass away in the "Boundless," were gods. This was, however, open in one respect to precisely the same objections that Xenophanes was in the habit of urging against the

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[91] The passage of M. X. G. is given R. P. 89 A. It contains a piece of Eleatic dialectic inconceivable before the days of Zeno and Melissos.

popular theology. "It is equally impious," he said, "to say that the gods have come into being and to say that they will pass away. In either case you have to say that there is a time when the gods are not."[92] If, then, the universe is really a god, there cannot be anything more primary than itself. There can be no eternal substance from which it is "separated out," and into which it is once more absorbed. Nor must you say, with Anaximenes and Pythagoras, that it is kept up by air which it breathes from outside. It itself must be eternal and boundless. Again, since there is nothing outside it at all, there can be no other world, and it must therefore be the "greatest god." It must also be immovable, or it could not be eternal.

The question now arises whether we can find room for other gods inside the world, as well as for the divine world itself, and it will be seen that this difficulty vanishes the moment we realise that Xenophanes did not believe in anything like a personal god at all. To us it naturally seems as if, in the early fragments, he were expounding an exalted and pure theology, because he denies of his "greatest god" a number of predicates which we have learned to regard as incompatible with the divine nature. We accordingly jump to the conclusion that Xenophanes declared God to be a spirit. But the conception of spirit as something different from matter did not yet exist, except in a rude animistic sense, and what Xenophanes proclamed as the "greatest god" was nothing more nor less than what we call the material world. When he says that this "sways all things by the thought of its mind," he means no more than Anaximander had meant by saying that his material substratum "steers the course of all things." Now we are not left altogether in the dark with regard to the departmental gods. They also were reduced to material phenomena. Iris was not the messenger between heaven and earth, but merely a coloured cloud (fr. 13), and the so-called Dioskouroi were likewise masses of vapour ignited by the rapid motion of the ships upon which they alight.[93] No doubt other gods were similarly explained away. To a Greek this would seem mere atheism; and Xenophanes certainly meant to say that the gods were natural phenomena, rather than that natural phenomena were gods. And the same is true of his "greatest god." He was probably far more interested in showing that the only greatest god there was, was simply the world, than in making out that the world was god. We may therefore paraphrase fr. 1, "there is one (so-called) god, who is the greatest among (so-called) gods." No doubt there is still a contradiction here; but it is simply what we shall see is the fundamental contradiction of the whole system. There is no greater difficulty in this juxtaposition of God and gods, than there is in the similar juxtaposition of "the All" and "all things."

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[92] Arist. *Rhet.* B, 23. 1399*b*, 6 (R. P. 81).

Cosmology. 49. We have seen that Xenophanes denied the conception of the primary substance altogether. In other respects he would seem to have followed as closely in the footsteps of Anaximander as this important modification would allow. He is, however, thoroughly sceptical as to all cosmological theories whatsoever, and it is probably to these that fr. 14 chiefly applies. And this is natural enough. So long as he was on purely negative ground he felt sure of himself; but the conception of the All at which he had arrived, by the process of denying the views of Anaximander and the poets, was obviously incapable of explaining anything at all. How could the immobility of the whole be reconciled with the motion of its parts? How could the One be also many?

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[93] Aet. ii. 18. 1 (*Dox.* p. 347). The reading of the MSS., **κατὰ τὴν ποιὰν κίνησιν παραλάμποντα**, is old, for it is given both by the *Placita* and Stobaios; but it impossible not to be tempted by Karsten's **κατὰ τὴν πλοίων κίνησιν πυρὶ λάμποντα.**

We ourselves, he tells us, like everything else which comes into being and grows, arise from earth and water (fr. 9, 10). This is, of course, the Anaximandrian view; but Xenophanes appears to have satisfied himself of its truth by a consideration of the imprints of animals and vegetables found in stone.[94] The importance of this has been pointed out in the *Introduction*.[95] The earth is not, however, as Anaximander had taught, a cylinder of definite height. Its roots stretch endlessly downwards, just as the air extends endlessly upwards.[96] This is a natural consequence of the belief that existence must be boundless, which was first denied by Parmenides, taken along with the conviction that, since the world is divine, there cannot be anything outside it. He also held that the earth stretches out boundlessly on every side;[97] a view which Tannery regards as due to the same sentimental longing as that expressed by Sully-Prudhomme in the lines—

> "Que sa face ne soit pas ronde,
> Mais s'étende toujours, toujours!"

It is true that the feeling here described is not unconnected with the ascription to the world of the boundlessness which Anaximander had confined to the undifferentiated primary substance outside it; but surely the latter is the more immediate source of Xenophanes' theory. Lastly, the earth is being gradually dissolved once more in the water, and will revert in time to its primitive condition of mud. The treatise on the *Indestructibility of the World*, which goes by the name of Philo, seems to have preserved some of the arguments by which this view was defended. We read there that "some" held that the earth had hitherto grown at the expense of the sea. The islands of Rhodes and Delos had gradually arisen from the waters. The "mighty gulfs of mighty seas" have been turned into land, and are sown and harvested; witness the pebbles and shells which are found inland. And, if the sea has been lessened in this way, it will next be the turn of the earth.[98] This theory no doubt explains the ascription to Xenophanes of a belief in innumerable worlds.[99]

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[94] Hipp. *Ref.* i. 14 (R. P. 86*a*).

[95] *Introd.* § X.

[96] Arist. *De Cœlo*, B, 13. 294*a*, 21 (R. P. 86*b*).

[97] Hipp. *Ref.* i. 14 (R. P. *ib.*).

Xenophanes also made some important changes in Anaximander's theory of the heavenly bodies, the motives of which it is not always easy to guess. Perhaps he thought the latent dualism of the older view led to dangerous consequences, and therefore resorted to a theory in some respects like that of Anaximenes. At any rate, he gave up the position that fiery vapour was as primitive as mud, and taught that the heavenly bodies arose from sparks collected out of the moist exhalation of the sea. They are, in fact, clouds which light up at night "like coals," and go out in the day-time.[100] It is not very easy to see how he reconciled this with the view that the sun is the cause of these very exhalations; but we cannot hope to make Xenophanes consistent. He appears to have said also that, while the sun was of some use in the ordering of the world, the moon was a superfluous adjunct.[101] This was, doubtless, a part of his polemic against the popular gods.

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[98] Diels, *Dox.* p. 486, 17 sq. Cf. *Prol.* p. 106, where it is shown that most of the passage comes from Theophrastos. The absurd etymologies and the quotation from Pindar found in the text are, of course, the private property of the forger. We seem to hear echoes of the versification of Xenophanes in many places. The agreement of the argument with that of Hipp. *Ref.* i. 14. 5, and Arist. *Meteor.* A, 14, is, however, the chief reason for believing the passage to refer to Xenophanes.

[99] Xenophanes is mentioned in the list of those who upheld an infinity of worlds, given by Aetios, ii. 1. 3; and D. L. ix. 19 (R. P. 86*c*), says he maintained κόσμους ἀπείρους οὐ παραλλάκτους δέ. It is true that the source of this passage is some wretched biographical handbook (*Dox.* 168); but, for all that, there are echoes of Theophrastos in it. I believe that what he said was that the worlds of Xenophanes did not παραλλάττειν, *i.e.* that they did not "overlap" (in time) like those of Anaximander.

As the earth extends indefinitely as a flat plain east and west, it follows that the heavenly bodies must travel across it in straight lines, and that the same sun, moon, and stars never pass over us twice. They only appear to go round the earth because of their distance. This probably means that as they get farther from us, they appear to come nearer and nearer to the horizon. A curious feature of the theory was, that when the stars in their courses came above certain uninhabited regions they at once went out. Further, as the earth does not only stretch boundlessly east and west, but also north and south, there must be many suns and moons travelling parallel to one another over its different zones.[102]

We have said enough to show that Xenophanes was not, properly speaking, a philosopher, and still less a scientific cosmologist. To reconcile the immovable "All" with the strange account he gives of "all things" would be impossible. Yet the very contradictions ~~in~~ which Xenophanes entangled himself were of the utmost importance for the history of philosophy, and it is therefore necessary for us to understand clearly how he became involved in them. To put it briefly, it was because he ascribed all the predicates of Anaximander's Boundless, with the important exception of motion, to the world within the heavens. The result is, of course, an insoluble contradiction. But it was, nevertheless, a true instinct which led him, almost accidentally, to the idea that the ground of the world must be found within the world itself. To show how this could be, was the next task which philosophy had to undertake.

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[100] Theophr. *Phys. Op.* fr. 16 (R. P. 86*c*). Diels has shown that this passage comes more directly from Theophrastos than usual. He is quoted by name, and πυρίδια is a Theophrastean word. It occurs also in the parallel passages.

[101] Aetios, ii. 30. 8.

[102] For all this see Aet. ii. 24. 9, and Hipp. *Ref.* i. 14. 3.

CHAPTER III.

HERAKLEITOS OF EPHESOS.

Life of Herakleitos.

50. DIOGENES, no doubt following Apollodoros, tells us that Herakleitos of Ephesos, son of Blyson, "flourished" in Ol. LXIX. (504–501 B.C.);[1] that is to say, just in the middle of the reign of Dareios, with whom several traditions connected him.[2] It is more important, however, for our purpose to notice that, while he refers to Pythagoras and Xenophanes by name and in the past tense (fr. 16), he is in turn distinctly referred to by Parmenides (v. 46 sqq.). These references are sufficient to mark his proper place in the history of philosophy. Zeller holds, indeed, that he cannot have published his work till after 478 B.C., on the ground that the expulsion of his friend Hermodoros, alluded to in fr. 114, could not have taken place before the downfall of Persian rule. If that were so, it would certainly be very difficult to see how Parmenides could have known the views of Herakleitos; but there is no need to accept Zeller's conclusion in this matter. There is no difficulty in supposing that the Ephesians may have sent one of their foremost citizens into banishment at a time when they were still paying tribute to the Great King. The Persians never took from the Greek States their internal

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[1] D. L. ix. 1 (R. P. 22).

[2] Bernays, *Die Heraklitischen Briefe*, p. 13 sqq.

self-government, and the spurious *Letters* of Herakleitos show that the accepted view in antiquity was that the expulsion of Hermodoros took place during the reign of Dareios.[3]

Sotion had preserved or invented a statement that Herakleitos was a disciple of Xenophanes,[4] which is clearly impossible; for Xenophanes must have left Kolophon for ever before Herakleitos was born. It is more likely that he was not a disciple of any one; but it is clear, at the same time, that he was acquainted both with the Milesian cosmology and with the poems of Xenophanes. He also knew something of the theories taught by Pythagoras (fr. 17).

Of the life of Herakleitos, we really know nothing at all. The origin of most of the statements bearing on it is quite transparent.[5] To accept the unexplained residue as historical is an utterly uncritical proceeding, though not by any means unexampled.

His book.

51. We do not know the title of the work of Herakleitos,[6] if, indeed, it had one at all, and it is not very

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[3] Bernays, *op. cit.* p. 20 sqq.

[4] Ap. D. L. ix. 5 (R. P. 22c).

[5] See Patin, *Heraklits Einheitslehre*, p. 3 sqq. Herakleitos said (fr. 68) that it was death to souls to become water; and we are told accordingly that he died of dropsy. He said (fr. 114) that the Ephesians should leave their city to their children, and (fr. 79) that Time was a child playing draughts. We are therefore told that he refused to take any part in public life, and went to play with the children in the temple of Artemis. He said (fr. 85) that corpses were more fit to be cast out than dung; and we are told that he covered himself with dung when attacked by dropsy. Lastly, he is said to have argued at great length with his doctors because of fr. 58. For these tales see D. L. ix. 3-5. It appears that even such writers as Hermippos and Neanthes of Kyzikos believed them. Cf. the stories about Empedokles discussed in Chap. V. § 81.

[6] The variety of titles enumerated by D. L. ix. 12 (R. P. 23*b*) seems to show that none was authentically known. That of "Muses" comes from Plato, *Soph.* 242 D. The others are mere "mottoes" (Schuster) prefixed by Stoic editors, and intended to emphasise their view that the subject of the work was ethical or political (D. L. ix. 15; R. P. 23*c*).

easy to form anything like a clear idea of its contents. We are told that it was divided into three discourses; one dealing with the universe, one political, and one theological.[7] It is not at all likely this division goes back to Herakleitos himself; all we can infer from the statement is that the work fell naturally into these three parts when the Stoic commentators took their editions of it in hand. There is the less reason for doubting this, however, as the poem of Empedokles followed much the same order of topics.

The style of Herakleitos is proverbially obscure, and got him the nickname of "the Dark" in antiquity.[8] He employs images without any indication of the point of comparison; and his frequent use of irony, oxymoron, and pregnant expressions makes the interpretation of isolated fragments very difficult. His plays upon words, too, which prepared the way for the etymological fancies of Kratylos, are sometimes a little confusing.[9] Now the fragments about the Delphic god and the Sibyl (fr. 11 and 12) seem to show that Herakleitos was conscious of writing a somewhat oracular style, and we are tempted to ask why he did so. All possible and impossible explanations have been given. Schuster held that he wished to conceal his meaning in order to avoid an accusation of impiety; Teichmüller maintained that he wished to hide his profound theological views from the profane vulgar. But Schleiermacher and Zeller have shown that all this is illusory. The truth is simply that there was as yet no such thing as a clear scientific prose style. Herakleitos could not find any but metaphorical language in which to express the new thoughts which had taken possession of his mind. Perhaps, too, we may even go so far as to admit that his contempt for the mass of mankind made him somewhat indifferent to the requirements of his readers. If men cared to dig for the gold they might find it (fr. 8); if not, they must be content with straw (fr. 51). This seems to have been the view taken by Theophrastos, who said that the headstrong temperament of Herakleitos sometimes led him into incompleteness and inconsistencies of statement.[10] But that is a very different thing from studied obscurity and the *disciplina arcani*; if Herakleitos does not go out of his way to make his meaning clear, neither does he hide it (fr. 11).

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[7] D. L. ix. 5 (R. P. 23). Mr. Bywater has followed this hint in his arrangement of the fragments. The three sections are 1–90, 91–97, 98–130.

[8] R. P. 23*a*. The epithet ὁ σκοτεινός is of late date, but Timon of Phlious already called him αἰνικτής (fr. 28, Wachsm.).

[9] The style of Herakleitos is well characterised by Gomperz, *Zu Heraklits Lehre* (*Sitzungsber. d. Wien. Ak.* [1886] p. 977 sqq.), and Patin, *Heraklits Einheitslehre* [1886], p. 11 sqq.

The fragments.

52. The first collection of Herakleitean fragments was that of Schleiermacher; but the richest mine was unknown when he wrote, namely, the Ninth Book of the *Refutation of all Heresies*, by Hippolytos. This contains an attempt to show that the heresy of the Monarchian Noetos was really derived from Herakleitos, not from the Gospel; and everything is quoted that can be twisted so as to favour this view. There can be little doubt that Hippolytos must have written this with the original before him; and that is more than we can be sure of in the case of any other writer who professes to quote Herakleitos. I give a version of the fragments according to the arrangement of Mr. Bywater's exemplary edition.[11]

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[10] Cf. D. L. ix. 6 (R. P. 24).

[11] For the history of the Herakleitean text, see the literature referred to in R. P. 22*a*, and especially the essays of Bernays (*Ges. Abh.* i.).

(1.) It is wise to hearken not to me but my argument, and to confess that all things are one.[12] R. P. 32.

(2.) Though this discourse is true evermore,[13] yet men are as unable to understand it when they hear it for the first time as before they have heard it at all. For, although all things happen in accordance with the account I give, men seem as if they had no experience of them, when they make trial of words and works such as I set forth, dividing each thing according to its nature and explaining how it truly is. But other men know not what they are doing when you wake them up, just as they forget what they do when asleep. R. P. 25.

(3.) Fools when they do hear are like the deaf; of them does the proverb bear witness that they are absent when present. R. P. 24*a*.

(4.) Eyes and ears are bad witnesses to men, if they have souls that understand not their language. R. P. 34.

(5.) The many have not as many thoughts as the things they

Schleiermacher, too, is still well worth study. Lassalle and Schuster are painful reading. That so much learning and acuteness should have been thrown away is almost tragic. Teichmüller is brilliant and suggestive, but finds a disproportionate number of mares' nests. The chief recent additions to the literature are the tracts of Gomperz and Patin referred to above (*n.* 9), along with the *Quellenstudien zu Heraklit* of the latter in the *Festschrift für Ludwig Urlichs* [1880]. A useful summary of all the views which have been taken as to the real meaning of Herakleitos will be found prefixed to the translation published by Mr. Patrick at Baltimore.

[12] Mr. Bywater adopts Miller's correction εἶναι for εἰδέναι. If we do not make this change and insert ἓν in Hipp. *Ref.* ix. 9 (cf. Philo, *Leg. All.* iii. 3, quoted in Mr. Bywater's note), we shall have to say that Hippolytos attributed some very strange phraseology to Herakleitos, and that the fragment he quoted in no way supported the point he was trying to make. Bernays shows less than his usual acumen in contending that Miller's reading would turn H. into an Eleatic (*Ges. Abh.* i. 82).

[13] I have no hesitation in understanding the word λόγος, with Zeller (p. 572, *n.* 2; Eng. trans. ii. p. 7, *n.* 2), simply as "argument," "discourse," "theory," "description," or the like. The Stoic interpretation, as we find it in Marcus Aurelius, iv. 46 (R. P. 25*b*), must be rejected altogether; the word λόγος did not mean Reason at all in early days. Patin (*Her. Stud.* p. 67) objects that it would be absurd for H. to say that his discourse had always existed. So it would; but ἐόντος means "being true" (Stein on Herod. i. 30). Cf. note on fr. 92.

meet with; nor, if they do remark them, do they understand them, though they believe they do.[14]

(6.) Knowing not how to listen nor how to speak.

(7.) If you do not expect the unexpected, you will not find it; for it is hard to be sought out and difficult.[15]

(8.) Those who seek for gold dig up much earth and find a little. R. P. 36*b*.

(10.) Nature loves to hide. R. P. 27*f*.

(11.) The lord whose is the oracle at Delphoi neither utters nor hides his meaning, but shows it by a sign. R. P. 23*a*.

(12.) And the Sibyl, with raving lips uttering things solemn, unadorned, and unembellished, reaches over a thousand years with her voice because of the god in her. R. P. 23*a*.

(13.) Am I to prize these things above what can be seen, heard, and learned?[16] R. P. 34.

(14.) . . . bringing untrustworthy witnesses in support of disputed points.

(15.) The eyes are more exact witnesses than the ears.[17] R. P. 34*b*.

(16.) The learning of many things teacheth not understanding, else would it have taught Hesiod and Pythagoras, and again Xenophanes and Hekataios. R. P. 24.

(17.) Pythagoras, son of Mnesarchos, practised inquiry beyond all other men, and made himself a wisdom of his own, which was but a knowledge of many things and an art of mischief.[18] R. P. 24*a*.

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[14] This is directed against the common Greek proverb (*Od.* xviii. 136; Archil. fr. 70), that men's wisdom extends just as far as their experience. It does not extend so far, says Herakleitos.

[15] I have departed from the punctuation of Mr. Bywater here, and supplied a fresh object to the verb as suggested by Gomperz (*Arch.* i. 100).

[16] It seems to me that we may take the fragment in this way even if we do not accept Schuster's view that Herakleitos was a Positivist. "These things" I take to be the cosmogonies, etc., of the poets. In the same way, we may probably infer from Polybios, iv. 40, that fr. 14 referred to the poets.

[17] Cf. Herod. i. 8. The application is, no doubt, the same as that of the last two fragments. Personal inquiry is better than tradition.

[18] See Chap. II. *n.* 50. I omit ἐκλεξάμενος ταύτας τὰς ξυγγραφάς with Schleiermacher. The words were inserted in an age when ἱστορίη was

(18.) Of all whose discourses I have heard, there is not one who attains to understanding that wisdom is apart from other things.

(19.) Wisdom is one thing. It is to know the thought by which all things are steered through all things. R. P. 32.

(20.) This order, which is the same in all things, no one of gods or men has made; but it was ever, is now, and ever shall be an everliving Fire, fixed measures of it kindling and fixed measures going out.[19] R. P. 28.

(21.) The transformations of Fire are, first of all, sea (and half of the sea is earth, half fiery storm-cloud).[20] . . . R. P. 28*b*.

(22.) All things are exchanged for Fire, and Fire for all things, as wares are exchanged for gold and gold for wares. R. P. 28.

(23.) (The earth) is liquefied, and the sea is measured by the same tale as before it became earth.[21] R. P. 31.

(24.) Fire is want and satiety. R. P. 29*a*.

(25.) Fire lives the death of earth, and air lives the death of fire; water lives the death of air, earth that of water. R. P. 30 A.

(26.) Fire will come upon and lay hold of all things.[22] R. P. 29*a*.

(27.) How can one hide from that which never sinks to rest?

(28.) It is the thunderbolt that steers the course of all things. R. P. 28*b*.

(29.) The sun will not exceed his measures; if he does, the Erinyes, the avenging handmaids of Justice, will find him out. R. P. 31.

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supposed to mean research in libraries. The intention of the interpolation is to prove that Pythagoras really did write books.

[19] The term *κόσμος* here probably means world-order, not world. The word *μέτρα* is an accusative of the internal object.

[20] On the word *πρηστήρ*, see below, § 58, *n*. 53.

[21] I read *διαχέεται γῆ καὶ θάλασσα μετρέεται* because of D. L. ix. 9 (R. P. 29), *πάλιν τε αὖ τὴν γῆν χεῖσθαι*. Cf. also Dübner's correction of Aetios (*Dox.* p. 284*a*, 1; b, 5), *ἔπειτα ἀναχαλωμένην τὴν γῆν ὑπὸ τοῦ πυρὸς χύσει* (*φύσει libri*) *ὕδωρ ἀποτελεῖσθαι*.

[22] It seems to me most likely that the words *κρινεῖ καί* were inserted by Hippolytos in order to get the Christian idea of a *κρίσις*.

(30.) The limit of East and West is the Bear; and opposite the Bear is the boundary of bright Zeus.[23]

(31.) If there were no sun, it would be night.

(32.) The sun is new every day.

(33.) *See above, Chap. I. n.* 12.

(34.) The seasons that bring all things.

(35.) Hesiod is most men's teacher. Men think he knew very many things, a man who did not know day or night! They are one.[24] R. P. 31*b*.

(36.) God is day and night, winter and summer, war and peace, satiety and hunger; but he takes various shapes, just as fire,[25] when it is mingled with different incenses, is named according to the savour of each. R. P. 31*b*.

(37.) If all things were turned to smoke, the nostrils would distinguish them.

(38.) Souls smell in Hades. R. P. 38*d*.[26]

(39.) It is cold things that become warm, and what is warm that cools; what is wet dries, and the parched is moistened.

(40.) It scatters things and brings them together; it approaches and departs.

(41, 42.) You cannot step twice into the same rivers; for fresh waters are ever flowing in upon you. R. P. 26*a*.

(43.) Homer was wrong in saying: "Would that strife might perish from among gods and men!" He did not see that he was praying for the destruction of the universe; for, if his prayer were heard, all things would pass away.[27] R. P. 27*d*.

(44.) War is the father of all and the king of all; and some he has made gods and some men, some bond and some free. R. P. 27.

(45.) Men do not know how that which is drawn in different directions harmonises with itself. The harmonious structure of the world depends upon opposite tension,[28] like that of the bow and the lyre. R. P. 27.

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[23] The Arktos is doubtless *Ursa Major*, but the οὖρος is hardly Arcturus (Teichmüller). It seems to me to be simply the clear noon-day sky, put for μεσημβρία.

[24] Hesiod said one was the child of the other.

[25] Reading ὅκωσπερ πῦρ for ὅκωσπερ with Diels.

[26] For the probable meaning of these two fragments, see below, § 68.

[27] The words οἰχήσεσθαι γὰρ πάντα come from Simpl. *in Cat.* (*Schol. Br.* 88*b*, 28), and seem to me genuine.

(46.) It is opposition[29] that brings things together.

(47.) The hidden harmony is better than the open. R. P. 27.

(48.) Let us not conjecture at random about the greatest things.

(49.) Men who love wisdom must be acquainted with very many things indeed.

(50.) The straight and the crooked path of the fuller's comb is one and the same.

(51.) Asses would rather have straw than gold. R. P. 24*a*.

(51*a*.) Oxen are happy when they find bitter vetches to eat. R. P. 40*b*.

(52.) The sea is the purest and the impurest water. Fish can drink it, and it is good for them; to men it is undrinkable and destructive. R. P. 39*c*.

(53, 54.) Swine like to wash in the mire rather than in clean water, and barnyard fowls in dust.

(55.) Every beast is tended with blows.

(56.) *Same as* 45.

(57.) Good and ill are the same. R. P. 39*c*.

(58.) Physicians who cut, burn, stab, and rack the sick, then complain that they do not get any adequate recompense for it.[30] R. P. 39*c*.

(59.) You must couple together things whole and things not whole, what is drawn together and what is drawn asunder, the harmonious and the discordant. The one is made up of all things, and all things issue from the one.

(60.) Men would not have known the name of justice if there were no injustice.

(61.) Men themselves have made a law for themselves, not knowing what they made it about; but the gods have ordered the nature of all things. Now the arrangements which men have made are never constant, neither when they are right nor when they are wrong; but all the arrangements which the gods have made are always right, both when they are right and when they are wrong; so great is the difference.[31] R. P. 37*c*.

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[28] I read παλίντονος from fr. 56, Byw. On παλίντροπος, see below, *n.* 60, and Chap. IV. *n.* 11.

[29] Perhaps ἀντίξοον has here a more primitive sense, such as "opposite friction" (cf. ξέω).

[30] Adopting Mr. Bywater's reconstruction of the fragment given in his critical note.

(62.) We must know that war is the common and justice is strife, and that all things come into being and pass away (?) through strife.

(63.) . . . for they are undoubtedly allotted by destiny.[32]

(64.) All the things we see when awake are death,[33] even as the things we see in slumber are sleep. R. P. 34*b*.

(65.) Wisdom is one only. It is willing and unwilling to be called by the name of Zeus. R. P. 32.

(66.) The bow (βιός) is called life (βίος), but its work is death. R. P. 40*c*, *note* 2.

(67.) Mortals are immortals and immortals are mortals, the one living the other's death and dying the other's life. R. P. 38.

(68.) For it is death to souls to become water, and death to water to become earth. But water comes from earth; and, from water, soul. R. P. 30 B.

(69.) The way up and the way down is one and the same. R. P. 29*d*.

(70.) The beginning and the end are common (to both paths).

(71.) You will not find the boundaries of soul by travelling in any direction. R. P. 33*d*.

(72.) It is pleasure to souls to become moist. R. P. 38*b*.

(73.) A man, when he gets drunk, is led by a beardless lad, knowing not where he steps, having his soul moist. R. P. 34.

(74–76.) The dry soul is the wisest and best.[34] R. P. 34.

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[31] Cf. R. P. 37. I have not hesitated to substitute the words given by Ps.-Hippokrates, *De Diæta*, i. 11 (R. P. 37*e*), for the paraphrase of the Homeric scholiast. They have unquestionably the true Herakleitean ring. See *n.* 56.

[32] That is, I suppose, war, strife, and the like, which are spoken of in the foregoing fragments.

[33] That is, they are the death of Fire (fr. 25).

[34] This fragment is interesting because of the great antiquity of the corruptions which it has suffered. I cannot help thinking that Stephanus

(77.) Man is kindled and put out like a light in the nighttime.

(78.) The quick and the dead, the waking and the sleeping, the young and the old, are the same; the former are changed and become the latter, and the latter in turn are changed into the former. R. P. 39.

(79.) Time is a child playing draughts, the kingly power is a child's. R. P. 32*a*.

(80.) I have sought to know myself. R. P. 40.

(81.) We step and do not step into the same rivers; we are and are not. R. P. 26*a*.

(82.) It is a weariness to labour at the same things and to be always beginning afresh.

(83.) It finds rest in change.

(84.) Even the ingredients of a posset separate if it is not stirred.

(85.) Corpses are more fit to be cast out than dung.

(86.) When they are born, they wish to live and to meet with their dooms—or rather to rest, and they leave children behind them to meet with dooms in turn.

(87-89.) A man may be a grandfather in thirty years.

(90.) Those who are asleep are fellow-workers. . . .

(91.) Wisdom is common to all things. Those who speak

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saw the true state of the case more clearly than most of his successors have done; and, judging from his *obeli*, Mr. Bywater seems to think so too. According to him we should read: Αὔη ψυχὴ σοφωτάτη καὶ ἀρίστη, ξηρή (or rather ξηρά—the Ionic form would only appear when the word got into the text) being a mere gloss upon the somewhat unusual αὔη. When once ξηρή got into the text, αὔη became αὐγή, and we get the sentence: "the dry light is the wisest soul," whence the *siccum lumen* of Bacon. Now this reading is certainly as old as Plutarch, who, in his life of Romulus, c. 28, takes αὐγή to mean lightning, as it sometimes does, and supposes the idea to be that the wise soul bursts through the prison of the body like dry lightning (whatever that may be) through a cloud. I do not think that Clement's making the same mistake proves anything at all (Zeller, p. 643, *n.* 2; Eng. trans. i. p. 80, *n.* 2), except that he had read his Plutarch. The idea implied as to the relation between soul and body is Neoplatonic. Lastly, it is worth noticing that, though Plutarch must have written αὐγή, the MSS. vary between αὔτη and αὐτή. The next stage is the corruption of the corrupt αὐγή into οὗ γῆ. This yields the sentiment that "where the earth is dry, the soul is wisest," and is as old as Philo (see Mr. Bywater's notes).

with intelligence must hold fast to the common as a city holds fast to its law, and even more strongly. For all human laws are fed by one thing, the divine. It prevails as much as it will, and suffices for all things with something to spare. R. P. 35.

(92.) Though wisdom[35] is common, yet the many live as if they had a wisdom of their own. R. P. 36.

(93.) They are estranged from that with which they have most constant intercourse.

(94.) It is not meet to act and speak like men asleep.

(95.) The waking have one and the same world, but the sleeping turn aside each into a world of his own.

(96.) The way of man has no wisdom, but that of the gods has. R. P. 37.

(97.) Man is called a baby by god, even as a child by a man. R. P. 37.

(98, 99.) The wisest man is an ape compared to god, just as the most beautiful ape is ugly compared to man.

(100.) The people must fight for its law as for its walls. R. P. 40.

(101.) Greater deaths win greater portions. R. P. 40*d*.

(102.) Gods and men honour those who are slain in battle. R. P. 40*d*.

(103.) Wantonness needs to be extinguished even more than a conflagration. R. P. 40*d*.

(104.) It is not good for men to get all they wish to get. It is disease that makes health pleasant and good; hunger, plenty and weariness, rest. R. P. 40*b*.

(105–107.) It is hard to fight with desire.[36] Whatever it wishes to get, it purchases at the cost of soul. R. P. 40*d*.

(108, 109.) It is best to hide folly; but it is a hard task in times of relaxation, over our cups.

(110.) And it is the law, too, that we obey the counsel of one. R. P. 40*d*.

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[35] I read τοῦ φρονέειν instead of τοῦ λόγου here. It is τὸ φρονέειν which is said to be "common" in fr. 91, of which this seems to be the direct continuation. The κοινὸς λόγος of the Stoics accounts for the change.

[36] I suppose θυμός to be used in the Homeric sense. The gratification of desire implies the exchange of dry soul-fire (fr. 74) for moisture (fr. 72).

(111.) For what thought or wisdom have they? They follow the poets and take the crowd as their teacher, knowing not that there are many bad and few good. For even the best of them choose one thing above all others, immortal glory among mortals, while most of them fill their bellies like beasts. R. P. 24*a*.

(112.) In Priene lived Bias, son of Teutamas, who is of more account than the rest. (He said, "Most men are bad.")

(113.) One is as ten thousand to me, if he be the best. R. P. 24*a*.

(114.) The Ephesians would do well to hang themselves, every grown man of them, and leave the city to beardless youths; for they have cast out Hermodoros, the best man among them, saying: "We will have none who is best among us; if there be any such, let him be so elsewhere and among others." R. P. 22*b*.

(115.) Dogs bark at every one they do not know. R. P. 24*a*.

(116.) . . . (The wise man) is not known because of men's want of belief.

(117.) The fool is fluttered at every word. R. P. 36*b*.

(118.) The most esteemed of those in estimation knows how to feign; yet of a truth justice shall overtake the artificers of lies and the false witnesses.[37]

(119.) Homer should be turned out of the lists and whipped, and Archilochos likewise. R. P. 24.

(120.) One day is equal to another.

(121.) Man's character is his fate.

(122.) There awaits men when they die such things as they look not for nor dream of. R. P. 38*d*.

(123.) . . . that they rise up and become the guardians of the hosts[38] of the quick and dead. R. P. 38*d*.

(124.) Night-walkers, Magians, priests of Bakchos and priestesses of the wine-vat, mystery-mongers. . . .

(125.) The mysteries into which men are initiated are unholy. R. P. 40.

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[37] The reference is doubtless to Homer or Hesiod.

[38] Adopting the correction suggested by Mr. Bywater in his critical note. The reading suggested in the note to R. P. ed. 7 (ἐν ᾅδῃ ἐόντας or εὕδοντας), also deserves consideration.

(126.) And they pray to these images, as if one were to talk with a man's house, knowing not what gods or heroes are. R. P. 40*c*.

(127.) For if it were not to Dionysos that they made a procession and sang the shameful phallic hymn, they would be acting most shamelessly. But Hades is the same as Dionysos in whose honour they go mad and keep the feast of the winevat. R. P. 40*e*.

(129, 130.) They purify themselves by defiling themselves with blood, just as if one who had stepped into the mud were to go and wash his feet in mud.

The doxographical tradition.

53. It will be seen that some of these fragments are very far from clear, and there are probably not a few of which the meaning will never be recovered. We naturally turn, then, to the doxographers for a clue to guide us through the labyrinth; but, as ill-luck will have it, they are far less instructive with regard to Herakleitos than we have found them in other cases. We have, in fact, two great difficulties to contend with. The first is, the unusual weakness of the doxographical tradition itself. Hippolytos, upon whom we can generally rely for a fairly accurate account of what Theophrastos really said, derived the material for his first four chapters, which treat of Thales, Pythagoras, Herakleitos, and Empedokles, not from the excellent epitome of Theophrastos which he afterwards used, but from a wretched biographical compendium.[39] For the most part, this seems to have consisted of apocryphal anecdotes and apophthegms. It was based, further, on some writer of *Successions* who regarded Herakleitos and Empedokles as Pythagoreans. They are therefore placed side by side, and their doctrines are

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[39] On the source used by Hippolytos in the first four chapters of *Ref.* i., see Diels, *Dox.* p. 145. We must carefully distinguish *Ref.* i. and *Ref.* ix. as sources of information about Herakleitos.

hopelessly mixed up together. The link between Herakleitos and the Pythagoreans was Hippasos of Metapontion, in whose system, as has been mentioned already, fire played an important part. Theophrastos, following Aristotle, had spoken of the two in the same sentence, and this was quite enough to put the writers of *Successions* off the track.[40] The extreme limit of confusion is reached by Justin, who, in a careless extract from the *Placita,* actually makes Herakleitos a Metapontine. We are forced, then, to look to the more detailed of the two accounts[41] of the opinions of Herakleitos given in Diogenes Laertios, which goes back to the *Vetusta Placita*, and is, fortunately, pretty full and accurate. All the other sources are more or less tainted.

The second difficulty which we have to face is even more serious. Schleiermacher rightly insisted upon the fact that most of the commentators upon Herakleitos mentioned in Diogenes were Stoics,[42] and it is likely that their paraphrases were sometimes taken for the original. Now, the Stoics held the Ephesian in peculiar veneration, and therefore sought to interpret him as far as possible in accordance with their own system. Further, they were more than usually unscrupulous in "accommodating"[43] the views of earlier thinkers to their own, and this has had very serious consequences. In particular, the Stoic theories of the world-intellect and the world-conflagration are constantly ascribed to Herakleitos by our authorities, and the very fragments are often adulterated with scraps of Stoic terminology.

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[40] Arist. *Met.* A, 3. 984*a*, 7 (R. P. 47*c*); Theophr. *Phys. Op.* ap. Simpl. *Phys.* 33 D (R. P. 29*c*).

[41] For these double accounts see Diels, *Dox.* p. 163 sq., and *Note on Sources*, B, § 15.

[42] D. L. ix. 15 (R. P. 23*c*).

[43] The word *συνοικειοῦν* is used for this by Philodemos, *De Pietate*, c. 13; and Cicero (*N. D.* i. 41) renders it by *accommodare*. Chrysippos in particular gave a great impulse to this sort of interpretation, and filled his books with quotations of all sorts which were supposed to support Stoic theories (Krische, *Forsch.* p. 480). Good examples are Aet. i. 13. 2, 28. 1; iv. 3. 12, where distinctively Stoic views are ascribed to Herakleitos.

The discovery of Herakleitos.

54. Herakleitos looks down, not only upon the mass of men, but even upon all previous inquirers into nature. Such an attitude can be explained only on the supposition that he believed himself to have attained insight into some important truth which had not been hitherto recognised, though it was, as it were, staring men in the face (fr. 93). Clearly, then, if we wish to get at the central thing in his teaching, we must try to find out of what he was thinking when he launched into all those denunciations of human dulness and ignorance. This is the point to which Patin has chiefly called attention. He has insisted that we must regard the whole system in the light of the answer we give to this question; and there can be no doubt that his procedure, if practicable, is a sound one. Now the answer to the question which has just been asked seems to be given in two fragments, 18 and 45. From these we gather that the truth which has hitherto been ignored is that the many apparently independent and conflicting things we know are really one, and that, on the other hand, this one is not something which does not admit of multiplicity, but that it is also many. The "strife of opposites" is really a "harmony." From this it naturally follows that wisdom is not the acquirement of a knowledge of many things, regarded as separate and conflicting, but is the perception of the underlying harmony of the warring opposites. It consists, not in a mass of information, but in the clear apprehension of the single fact (fr. 19) that opposites are one, that they are

but the two faces of the fire which is the thought that rules the world. The statement that this really is the fundamental thought of Herakleitos is confirmed by Philo, who, no doubt, had the complete work before him. He says: "For that which is made up of both the opposites is one; and, when the one is divided, the opposites are disclosed. Is not this just what the Greeks say their great and much belauded Herakleitos put in the forefront of his philosophy as summing it all up, and boasted of as a new discovery?"[44] We shall take the various elements of this theory one by one, and see how they are to be understood.

The One and the Many.

55. Xenophanes, by denying that the One could move or change, had made it impossible for himself to explain the changeful and moving Many, and was left face to face with an unsolved and insoluble contradiction, which did not, in all probability, disturb him very much. Herakleitos, by a partial return to the Milesian system, and by denying of the One everything which would render it incapable of explaining the world, once more made possible a coherent cosmology. That his system was really worked out in opposition to Xenophanes seems highly probable, though it has often been disputed on the ground that when Xenophanes spoke of the One he meant God. We have seen, however, that God with him was just the world. To arrive at the One, "you must," says Herakleitos, "couple together things whole and things not whole," that is, you must take account both of its unity and its division; for "the One is made up of all things, and all things issue from the One" (fr. 59). The One does not, in fact, stand alongside of

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[44] Philo, *Rer. Div. Her.* 43 (R. P. 27*e*).

all things, but includes them. They are in it, and it in them.[45]

The credit of having been the first to see that the One and the Many could be reconciled, is expressly assigned to Herakleitos by Plato. In the *Sophist* (242 D), the Eleatic stranger, after explaining how the Eleatics and their predecessors (no doubt the Milesians) had maintained that what we call many is really one, proceeds—

> But certain Ionian and (at a later date) certain Sicilian Muses remarked that it was safest to unite these two things, and to say that reality is both many and one, and is kept together by Hate and Love. "For," say the more severe Muses, "in its division it is always being brought together" (cf. fr. 59); while the softer Muses relaxed the requirement that this should always be so, and said that the All was alternately one and at peace through the power of Aphrodite, and many and at war with itself because of something they called Strife.

In this passage the Ionian Muses stand, of course, for Herakleitos, and the Sicilian for Empedokles. We remark also that the differentiation of the one into many, and the integration of the many into one, are both eternal and simultaneous, and that this is the ground upon which the system of Herakleitos is contrasted with that of Empedokles. We shall come back to this point again. Meanwhile we confine ourselves to this, that Herakleitos announced the doctrine of identity in and through difference as a means of bridging over the gulf which Xenophanes had allowed to subsist between "the All" and "all things."

[45] Patin has reconstructed the beginning of the work of Herakleitos in accordance with this, taking the fragments in the order, 1, 2, 93, 5, 3, 111, 91, 92. This, no doubt, fairly represents the theory; but I see no reason for believing that H. delivered himself of his whole doctrine at the very beginning of his book. Philo (*loc. cit.*) does not necessarily mean this.

We must be careful, however, not to imagine that what Herakleitos thus discovered was a logical principle. This was the great mistake of Lassalle's book.[46] The identity in and through difference which he proclaimed was purely physical; logic did not yet exist, and as the principle of identity had not been formulated, it would have been impossible to protest against an abstract application of it. The identity which he explains as consisting in difference is simply that of the primary substance in all its manifestations. This identity had already been clearly realised by the Milesians, but they had found a difficulty in the difference. Anaximander had treated the strife of opposites as an "injustice," and what Herakleitos set himself to show was that, on the contrary, it was the highest justice (fr. 62).

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[46] The source of his error was Hegel's really extraordinary statement that there was no proposition of Herakleitos that he had not taken up into his own logic (*Gesch. d. Phil.* i. 328). The example which he cites is the statement that Being does not exist any more than not-Being, for which he refers to Arist. *Met.* A, 4. This, however, is not there ascribed to Herakleitos at all, but to Leukippos or Demokritos, with whom it meant that space was as real as matter (§ 151). Aristotle does, indeed, tell us in the *Metaphysics* that "some" think Herakleitos says that the same thing can be and not be; but he adds that it does not follow that a man thinks what he says (*Met.* Γ, 3. 1005*b*, 24). I take this to mean that, though Herakleitos did make this assertion in words, he did not mean by it what the same assertion would naturally have meant at a later date. Herakleitos was speaking only of nature, the logical meaning of the words never occurred to him (Emminger, *Vors. Ph. n. d. Ber. des Ar.* p. 49). This is confirmed by K, 5. 1062*a*, 31, where we are told that by being questioned in a certain manner H. could be made to admit the principle of contradiction; as it was, he did not understand what he said. In other words, he was unconscious of its logical bearing.

These passages show clearly enough that Aristotle was aware that the theories of Herakleitos were not to be understood in a logical sense. On the other hand, this does not prevent him from saying that according to the view of Herakleitos, everything would be true (*Met.* Δ, 7. 1012*a*, 24). If we remember the true account of his attitude to earlier thinkers, this will not lead us to suspect either his good faith or his intelligence. (See *Note on Sources*, A. § 2.)

56. All this made it necessary for him to seek out some new primary substance. He wanted, not merely something out of which the diversified world we know might conceivably be made, or from which opposites could be "separated out," but something which of its own nature would pass into everything else, while everything else would pass in turn into it. This he found in Fire,—real fire, of course, "that burns and crackles," as Teichmüller puts it. The idea that he used fire as a symbol, or meant by it something inaccessible to the senses, is a mere survival of the interpretation of early Greek thought which Zeller finally overthrew.[47] And it is easy to see why he should have fixed upon fire. If we consider the phenomenon of combustion, even as it appears to the plain man, we shall understand this at

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[47] Yet even Zeller speaks of a symbol in this connexion. That the Fire of Herakleitos was something on quite the same level as the "Air" of Anaximenes is, however, clearly implied in such passages as Arist. *Met.* A, 3. 984*a*, 5. In support of the view that something different from common fire is meant, Plato, *Krat.* 413 C, is sometimes quoted; but a consideration of the context shows that the passage will not bear this interpretation. Plato is there discussing the fanciful derivation of δίκαιον from διά-ιον, and we must admit that δίκη was a prominent Herakleitean conception, and that a good deal that is here said may be the authentic doctrine of the school. But Sokrates goes on to complain that when he asks what this is which "goes through" everything, he gets very inconsistent answers. One says it is the sun. Another asks if there is no justice after sunset, and says it is simply fire. A third says it is not fire itself, but the heat which is in fire. A fourth identifies it with the Nous of Anaxagoras. Now all we are entitled to infer from this is that different accounts were given in the Herakleitean School. These were a little less crude than the original doctrine of the master, but for all that not one of them implies anything immaterial or symbolical. The view that it was not fire itself, but Heat, which "passed through" all things, is related to the theory of Herakleitos as Hippo's Moisture is related to the Water of Thales (Chap. IX. § 146). It is quite likely, too, that some Herakleiteans attempted to fuse the system of Anaxagoras with their own, just as Diogenes of Apollonia tried to fuse it with that of Anaximenes (Chap. IX. § 158).

once. The quantity of fire in a flame burning steadily appears to remain the same, the flame seems to be what we call a "thing." And yet the substance of it is continually changing. It is always passing away in smoke, and its place is always being taken by fresh matter from the fuel that feeds it. This is just what we want. If we regard the world as an "ever-living fire" (fr. 20), we can understand how it is always becoming all things, while all things are always returning to it.

Flux. 57. This necessarily brings with it a certain way of looking at the change and movement of the world. Fire burns continuously and without interruption. It is therefore always consuming fuel and always liberating smoke. Everything is either mounting upwards to serve as fuel, or sinking downwards after having nourished the flame. It follows that the whole of reality is like an ever-flowing stream, and that nothing is ever at rest for a moment. The substance of the things we see is therefore in constant change. Even as we look at them, some of the matter of which they are composed has already passed into something else, while fresh matter has come into them from another source. This theory is usually summed up, appropriately enough, in the phrase "All things are flowing," though, as it happens, it cannot be proved that this is a quotation from Herakleitos. It has even been maintained by Schuster that Herakleitos did not hold this view at all; though the statements of Plato do not really admit of any other interpretation. "Nothing ever is, everything is becoming;" "All things are in motion like streams;" "All things are passing, and nothing abides;" "Herakleitos says somewhere that all things pass and naught abides; and, comparing things to the current of a river, he says that you cannot step twice into the same stream" (cf. fr. 41),—these are the terms in which Plato, who had been a Herakleitean in his youth, describes the system. And Aristotle says the same thing, "All things are in motion," "nothing steadfastly is."[48] It is needless to collect further testimony; for, if this can be doubted, then everything we suppose ourselves to know about Greek philosophy may be doubted also. We affirm, then, that Herakleitos held that any given thing, however stable in appearance, was merely, so to speak, a section in the stream, and that the matter composing it was never the same in any two consecutive moments of time. We shall see presently how he conceived this process to operate; meanwhile we remark that the idea was not altogether a novel one, and that it is not the central point in the system of Herakleitos. The Milesians, we have seen, held a similar view. The flux of Herakleitos was at most more unceasing and universal.

The Upward and Downward path.

58. Herakleitos appears to have worked out the details of the perpetual flux with reference to the suggestions of Anaximenes.[49] It is unlikely, however, that he explained the transformations of matter by means of rarefaction and condensation.[50] Theophrastos, it appears, suggested that he did; but he allowed that it was by no means clear. The passage from Diogenes which we are about to quote has faithfully preserved this touch.[51] In the fragments, at any rate, we can find nothing about rarefaction and condensation. The expression used is

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[48] See Plato, *Theait.* 152 D; *Krat.* 401 D, 402 A; Arist. *Top.* A, 11. 104*b*, 22; *De Cælo*, Γ, 1. 298*b*, 30; *Phys.* Θ, 3. 253*b*, 9.

[49] See above, Chap. I. § 24. For the metaphor of "exchange," see Mr. Bywater's note on fr. 22.

[50] See, however, Diels' remark quoted R. P. 29c.

[51] D. L. ix. 7: σαφῶς δ' οὐθὲν ἐκτίθεται.

"exchange" (fr. 22); and this is certainly a very good name for what happens when fire gives out smoke and takes in fuel instead.

It has been pointed out already that, in default of Hippolytos, our best account of the Theophrastean doxography of Herakleitos is the fuller of the two accounts given in Diogenes Laertios. It is as follows:—

> His opinions on particular points are these:—
>
> He held that Fire was the element, and that all things were produced in exchange for fire, and that they arise from condensation and rarefaction. But he explains nothing clearly. All things were due to opposition, and all things were in flux like a river.
>
> The all is finite and the world is one. It arises from fire, and is consumed again by fire alternately through all eternity in certain cycles. This happens according to fate. That which leads to the becoming of the opposites is called War and Strife; that which leads to the final conflagration is Concord and Peace. (*This is the Stoic interpretation.*)
>
> He called change the upward and the downward path, and held that the world goes on according to this. When fire is condensed it becomes moist, and when collected together it turns to water; water being congealed turns to earth (*the conjecture of Theophrastos*); and this he calls the downward path. And, again, the earth is in turn liquefied, and from it water arises, and from that everything else; for he refers almost everything to the evaporation from the sea. This is the path upwards. R. P. 29.
>
> He held, too, that exhalations arose both from the sea and the land; some bright and pure, others dark. Fire was nourished by the bright ones, and moisture by the others.
>
> He does not make it clear what is the nature of that which surrounds the world. He held, however, that there were bowls in it with the concave sides turned towards us, in which the bright exhalations were collected and produced flames. These were the heavenly bodies.
>
> The flame of the sun was the brightest and warmest; for the other heavenly bodies were more distant from the earth; and

for that reason gave less light and heat. The moon, on the other hand, was nearer the earth; but it moved through an impure region. The sun moved in a bright and unmixed region, and at the same time was at just the right distance from us. That is why it gives more heat and light. The eclipses of the sun and moon were due to the turning of the bowls upwards, while the monthly phases of the moon were produced by a slight turning of its bowl.

Day and night, months and seasons and years, rains and winds, and things like these, were due to the different exhalations. The bright exhalation, when ignited in the circle of the sun, produced day, and the preponderance of the opposite exhalations produced night. The increase of warmth proceeding from the bright exhalation produced summer, and the multiplication of moisture from the dark exhalation produced winter. He assigns the causes of other things in conformity with this.

As to the earth, he makes no clear statement about its nature, any more than he does about that of the bowls.

These, then, were his opinions. R. P. 31*b*.

It is obvious that, if we can trust this passage, it is of the greatest possible value; and that, upon the whole, we can trust it has been shown by Diels. It bears the marks of its source clearly upon it, and that source is none other than the *Vetusta Placita* from which Aetios also drew. It follows the exact order of topics to which all the doxographies that are derived from the great work of Theophrastos adhere. First we have the primary substance, then the world, then the heavenly bodies, and lastly, meteorological phenomena. We conclude, accordingly, that it may be accepted with the exceptions, firstly, of the probably erroneous conjecture of Theophrastos mentioned above;[52] and secondly, of a piece of Stoical interpretation due to the *Vetusta Placita*.

Let us look at the details of the theory. The pure elemental fire, we are told, is to be found chiefly in the sun. This, like the other heavenly bodies, is a trough or bowl, or perhaps a sort of boat, with the concave side turned towards us, in which the bright exhalations from the sea collect and burn. How does the fire of the sun pass into other forms? If we look at the fragments which deal with the downward path, we find that the first transformation that it undergoes is into sea, and we are further told that half of the sea is earth and half of it *πρηστήρ* (fr. 21). The full meaning of this we shall see presently, but we must settle at once what *πρηστήρ* is. Many theories have been advanced upon this subject; but, so far as I know, no one has yet proposed to take the word in the sense which it always bears elsewhere, that, namely, of hurricane accompanied by a fiery waterspout.[53] Yet surely this is just what is wanted. It is amply attested that Herakleitos explained the rise of the sea to fire by means of the bright evaporations; and Schleiermacher pointed out long ago that we want a similar meteorological explanation of the passing of the fire back into sea. We want, in fact, something which will stand equally for the smoke produced by the burning of the sun, and for the intermediate stage between fire and water. What could serve the turn better than a fiery waterspout? It sufficiently resembles smoke to be accounted for as the product of the sun's combustion, and it certainly comes down in the form of water. And this view becomes, I submit, a practical certainty when it is taken in connexion with the strangely neglected report of Aetios as to the Herakleitean theory of πρηστῆρες. They were due, we are told, "to the kindling and extinction of clouds."[54] In other words, the bright vapour, after kindling in the bowl of the sun and going out again, reappears as the dark fiery storm-cloud, and so passes once more into the sea. At the next stage we find water continually passing into earth. We are already familiar with this idea (§ 9), and no more need be said about it. Turning to the "upward path," we find that the earth is liquefied in the same proportion as the sea becomes earth, so that the sea is still "measured by the same tale" as before (fr. 23). Half of it is earth and half of it is πρηστήρ (fr. 21). This must mean that, at any given moment, half of the sea is taking the downward path, and has just been fiery storm-cloud, while half of it is going up, and has just been earth. In proportion as the sea is increased by rain, water passes into earth; in proportion as the sea is diminished by evaporation, it is fed by the earth. Lastly, the ignition of the bright vapour from the sea in the bowl of the sun completes the circle of the "upward and downward path." Its beginning and end are the same, namely, fire (fr. 70).

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[52] See above, *n.* 50.

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[53] Seneca (Q. N. ii. 56) calls it *igneus turbo*. Cf. Herod. vii. 42 and Lucr. vi. 424. The opinions of early philosophers on the subject of these phenomena are collected in Aetios, iii. 3. The *πρηστήρ* of which Anaximander spoke is, of course, an entirely different word (Chap. I. *n*. 93).

Measure for measure.

59. The question now arises, How is it that, in spite of this constant flux, things appear relatively stable? The answer of Herakleitos was that it is owing to the observance of the "measures" of each form of matter, in virtue of which its aggregate bulk in the long run remains the same, though its substance is constantly changing. Certain "measures" of the "ever-living fire" are always being kindled, while like "measures" are always going out (fr. 20); and these measures the sun

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[54] Aet. iii. 3. 9: πρηστῆρας δὲ κατὰ νεφῶν ἐμπρήσεις καὶ σβέσεις (sc. Ἡράκλειτος ἀποφαίνεται γίγνεσθαι).

will not exceed (fr. 29). All things are "exchanged" for fire, and fire for all things (fr. 22); and this implies that fire will take as much and no more than it gives, if the exchange is to be just; and that it will be just, at least in the long run, is guaranteed by the Erinyes, who appear here, as in Homer,[55] as the guardians of what we call "natural law." The sea, too, preserves its "measures" (fr. 23), and it follows necessarily from this that the earth does so as well.

The "measures" are not, however, absolutely fixed, at least in one respect. We must allow for periodical encroachments of water upon fire, and of fire upon water, which produce the alternation of night and day, summer and winter. The subject is an obscure one, and we are at first sight confined to what Diogenes tells us about it; none of the fragments seem to deal with this at all. There are, however, as Bernays has shown, certain obviously Herakleitean utterances in the pseudo-Hippokratean *Περὶ διαίτης* which do refer to it.[56] The following sentence especially must have been copied straight out of Herakleitos:—

> And in turn each (*i.e.* fire and water) prevails, and is prevailed over to the greatest and the least degree that is possible. For neither can prevail altogether for the following reasons. If

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[55] *Il.* xix. 418. This function of the Erinyes was pointed out by Welcker.

[56] The presence of Herakleitean matter in this work was first pointed out by J. M. Gesner in his *De animabus Heracliti et Hippocratis ex huius libro* i. *de diaeta disputatio* [1752]. Schleiermacher entirely neglected this source, to which attention was called once more by Bernays in his *Heraclitea* [1848] (*Ges. Abh.* i. 1 sqq.). The relevant parts of the *De Diaeta* are printed as an appendix to Mr. Bywater's edition of the fragments. Bernays, it should be said, seriously over-estimated the amount of Herakleitean material which can be derived from this source. A great deal of it is obviously from Anaxagoras. The treatise itself seems to belong to the eclectic medical reaction described in Chap. IX. § 157.

fire advances to the utmost limit of the water, its nourishment fails it. It retires, then, to a place where it can get nourishment. And if water advances to the utmost limit of the fire, movement fails it. At that point, then, it stands still; and, when it stands still, it has no longer power to resist, but is at once consumed as nourishment for the fire that falls upon it. For these reasons neither can prevail altogether. But, if at any time either should in any way be overcome, then none of the things that exist would be as they are now. So long as things are as they are, fire and water will always be too, and neither will ever fail.—Ps.-Hipp. *De Diæta*, i. 3.

The last sentence shows conclusively that the passage deals with the world at large. This, however, is not the subject of the book from which it is taken. The author of the tract is trying to apply what Herakleitos had said of the world as a whole to the human body. Sometimes, however, he allows something to stand which betrays the original application of the passage, and in these cases we may be certain that we have got a genuine quotation. We are entitled, then, to fake this passage along with what Diogenes tells us about the bright and dark exhalations; and, if the two things fit together, we may be pretty sure that we have got the authentic doctrine.

The alternation of day and night.

60. We see, then, that the "measures" are not to be regarded as always absolutely equal. They are determined only by a maximum and a minimum. But this does not interfere with the "justice" of the "exchange," because the preponderance of water is always succeeded by an equal preponderance of fire, and *vice versa*. Herakleitos also showed how the balance was restored. Neither fire nor water can exist without the other, and therefore the encroachment of either is necessarily followed by a compensatory encroachment of the other. This oscillation

explains the alternations of day and night, winter and summer.

Diogenes tells us that fire was kept up by the bright vapours from land and sea, and we have already seen how this is to be understood. What are the "dark" vapours which increase the moist element? With some diffidence, I venture to suggest that they are simply darkness itself. We know that the idea of darkness as mere privation of light is not natural to the unsophisticated mind. We shall see that Empedokles announced it as a remarkable discovery that night was simply the shadow of the earth,[57] and we sometimes hear even now of darkness "thick enough to cut with a knife." I suppose, then, that Herakleitos believed night and winter to be produced by the rise of darkness from earth and sea,—he knew, of course, that the valleys were dark before the hill-tops,—and that this darkness, being moist, so increased the watery element as to put out the sun's light. This, however, destroyed the power of darkness itself. It could no longer rise upwards unless the sun gave it motion, and so it becomes possible for a fresh sun (fr. 32) to be kindled, and to nourish itself at the expense of the moist element for a time. But it can only be for a time. The sun, by burning up the bright vapour, deprives himself once more of nourishment, and the dark vapour again gets the upper hand. It is in this sense that "day and night are one" (fr. 35). The one necessarily implies the other, and they are therefore to be regarded as merely two sides of the one, in which alone their true ground of explanation is to be found (fr. 36).

Summer and winter were easily to be explained in the same way. We know that the solstices and equinoxes were a subject of the greatest interest in those days, and it was natural for Herakleitos to see in the retreat of the sun farther and farther to the north the gradual encroachment of the moist element, which must produce in time an equal encroachment of fire, which will lengthen the days and give rise to summer.[58]

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[57] Cf. v. 160.

Strife and harmony.

61. We are now in a position to understand the law of strife or opposition which manifests itself in the "race in opposite directions," as Theophrastos probably called the "upward and downward path."[59] At any given moment, each of the three forms of matter, Fire, Water, and Earth, is made up of two equal portions, — subject, of course, to the oscillation just described,—one of which is taking the upward and the other the downward path. Now, it is just the fact that the two halves of everything are being "drawn in opposite directions," this "opposite tension," or "friction of opposite motions," that "keeps things together," and maintains them in an equilibrium which can only be disturbed temporarily and within certain limits. It thus forms the "unseen harmony" of the universe (fr. 47), though, in another aspect of it, it is Strife. Bernays has pointed out that the word "harmony" meant originally "structure," and the illustration of the bow and the lyre shows that this idea was present. On the other hand, that taken from the concord of high and low notes shows that the musical sense of the word, namely, an octave, was not wholly absent. Now, it was certainly the Pythagoreans that mixed up the two senses of the word, and it is difficult

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[58] See the *De Diæta*, i. 5, and compare with it fr. 35 and 36. This theory was adopted from Herakleitos by Kleanthes (fr. 29, Pearson).

[59] It is called ἐναντιοδρομία in Aet. i. 7. 22 (*Dox.* p. 303).

not to suspect a reference to their theory. Herakleitos seems to point out that the harmony of the world was to be found just in that "Strife of Opposites" upon which Anaximander had insisted, and which had probably led Pythagoras into dualism (§ 41). As to the "bow and the lyre" (fr. 45), I think that Professor Campbell has best brought out the point of the simile. "As the arrow leaves the string," he says, "the hands are pulling opposite ways to each other, and to the different parts of the bow (cf. Plato, *Rep.* 4. 439); and the sweet note of the lyre is due to a similar tension and retention. The secret of the universe is the same."[60] War, then, is the father and king of all things, in the world as in human society (fr. 44); and Homer's wish that strife might cease was really a prayer for the destruction of the world (fr. 43).

We know from Philo that Herakleitos supported his theory of the attainment of harmony through strife by a multitude of examples; and, as it happens, some of these can be recovered. There is a remarkable agreement between a passage of this kind in the pseudo-Aristotelian treatise, entitled *The Kosmos*, and the Hippokratean work to which we have already referred. That the authors of both drew from the same source, namely, Herakleitos, is probable in itself, and is made practically certain by the fact that this agreement extends in part to the *Letters of Herakleitos*, which, though spurious, were certainly composed by some one who had access to the original work. The argument clearly was that men themselves act just in the same way as Nature, and that it is therefore surprising that they do not recognise the laws by which she works. It is true that they are most estranged from that with which they are most familiar (fr. 93). Two of the examples given are certainly Herakleitean. The painter produces his harmonious effects by the contrast of colours, the musician by that of high and low notes. "If one were to make all things alike, there would be no delight in them." There are a number of similar examples in the Hippokratean tract, some of which must certainly come from Herakleitos; but it is not easy to separate them from the later additions.[61]

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[60] Campbell's *Theætetus* (2nd ed.), p. 244. I assume that Herakleitos did not say both *παλίντονος* and *παλίντροπος*. The latter epithet comes, no doubt, from Parmenides, v. 51 (R. P. 94 B), which, as we shall see, refers to something rather different (Chap. IV. *n*. 11).

Alleged conflagration of the world.

62. The account which has now been given of the cosmology of Herakleitos is, I submit, consistent with itself, with the most intelligible fragments, and with Plato; but it is in direct contradiction with the statements of most writers, ancient and modern. They affirm that Herakleitos taught the doctrine of the alternate formation of the world out of fire, and its reabsorption in fire by a general conflagration. Ancient authors very generally ascribe to him the Stoical theory of *Ekpyrosis;* and all modern writers, with the exception of Schleiermacher, Hegel, and Lassalle, follow them in this. Some —as, for example, Schuster—throw doubt upon the continuous process altogether; most, with Zeller, admit both

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[61] See on all this Patin's *Quellenstudien*, referred to above, *n.* 11. The sentence (*De Diæta*, i. p. 643, Kuhn): *καὶ τὰ μὲν πρήσσουσιν οὐκ οἴδασιν, ἃ δὲ οὐ πρήσσουσι δοκέουσιν εἰδέναι· καὶ τὰ μὲν ὁρέουσιν οὐ γινώσκουσιν, ἀλλά κως αὐτοῖσι πάντα γίνεται . . . καὶ ἃ βούλονται καὶ ἃ μὴ βούλονται*, has the true Herakleitean ring. This, too, can hardly have had another author: "They trust to their eyes rather than to their understanding, though their eyes are not fit to judge even of the things that are seen. But I speak these things from understanding." These words are positively grotesque in the mouth of the medical compiler; but we are accustomed to hear such things from the Ephesian. Other examples which may be genuine are the image of the two men sawing wood,—"one pushes, the other pulls" (cf. *τὸ ἀντίξοον*),—and the illustration from the art of writing.

a continuous process and a periodical conflagration. Zeller makes, however, the important admission that the two are really irreconcilable.[62] To me it seems that the theory of a general conflagration is not merely irreconcilable with the other views of Herakleitos (he might have held it for all that), but that it is denied by him in so many words. I hold, therefore, that the conflagration was not universal, but simply an oscillation in the "measures" like that which produces day and night, summer and winter, only on a larger scale.

Taking, first of all, the evidence of the fragments themselves, I would observe that the "measures" of fr. 20 and fr. 29 must refer to the same thing, and that they must surely be interpreted in the light of fr. 23. If this be so, fr. 20, and more especially fr. 29, directly contradict the idea of a general conflagration, which would be a great violation of the "measures" of fire.[63] Secondly, the metaphor of "exchange," which is applied to the transformations of fire in fr. 22, points in the same direction. When gold is given in exchange for wares and wares for gold, the sum or "measure" of each remains constant, though they change owners. All the wares and all the gold do not come into the same hands. In the same way, when anything becomes fire, something of equal amount must cease to be fire, if the "exchange" is to be a just one; and that it will be just, we are assured by the watchfulness of the Erinyes (fr. 29), who see to it that the sun does not take more than he gives. Of course there is, as we have seen, a certain variation; but it is strictly confined within limits, and is immediately compensated by a variation in the other direction. Thirdly, fr. 43, in which Herakleitos blames Homer for desiring the cessation of strife, is very conclusive. The cessation of strife would mean that all things should simultaneously take the upward or the downward path, and cease to "run in opposite directions." If all things took the upward path, we should have a general conflagration. Now, if Herakleitos had himself held that this was the appointment of fate, would he have been likely to upbraid Homer for desiring so necessary a consummation? Fourthly, we note that in fr. 20 it is the actual order of the world,[64] and not merely the "ever-living fire," which is said to be eternal; and it appears also that its eternity depends upon the fact that it is always kindling and always going out in the same "measures" or proportion, or that an encroachment in one direction is compensated by a subsequent encroachment in the other. Lastly, Lassalle's argument from the concluding sentence of the passage from the *Περὶ διαίτης*, quoted above, is really untouched by Zeller's objection, that it cannot be Herakleitean because it implies that all things are fire and water. It does not imply this, but only that *man*, like the heavenly bodies, oscillates between fire and water; and this is just what Herakleitos actually taught. It does not appear either that the measures of earth varied at all. Now, in this passage we read that neither fire nor water can prevail completely, and a very good reason is given for the statement,—a reason, too, which is quite in conformity with the other doctrines of Herakleitos. But, on Zeller's view, both fire and water do prevail completely at different periods of the world's history.

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[62] Zeller, p. 638 sq. (Eng. trans. ii. p. 75 sq.).

[63] If any one doubts that this is really the meaning of the "measures," let him compare the use of the word by Diogenes of Apollonia, fr. 4.

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[64] I hold with Bernays that *κόσμος* does not mean "world" in Herakleitos but "the *order* of the world"; but the meaning is the same in any case.

As to the fragments which have been supposed to countenance the theory of a general conflagration, I would point out, firstly, that they are far from being the most important and certain of the utterances of Herakleitos; and, secondly, that they are by no means unambiguous. In fr. 24 we have the words "Want" and "Plenty," and there can be no doubt that the Stoics understood these as metaphorical expressions for their *Diakosmesis* and *Ekpyrosis*. If, however, we look at the context in Hippolytos, we see that what Herakleitos really said was that Fire was (at once) Want and Plenty (cf. fr. 36). This is a very expressive way of describing the *continuous* process of combustion, and, in view of the metaphor of "exchange," we might almost paraphrase it by saying that Fire is at once demand and supply, which, we know, have the same "measures." Fire has always plenty, for it is always giving away its substance in fiery storm-cloud; and it is always in want, for it needs to be kept up by a constant supply of bright vapour. Nor is fr. 26 any more inconsistent with our interpretation. Fire will certainly come upon all things; but upon each in turn, not upon all at once. It will not adopt the suicidal policy of destroying its means of nourishment, which will only hold out if it consumes them gradually and at the same time renews them, if it recedes as far as it has encroached. This, too, is the real meaning of what we are told of the Great Year.[65] It is the time taken by the encroachment of fire and its subsequent retreat, the re-enactment on a larger scale of the alternation of day and night, summer and winter.

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[65] The statements as to the precise duration of this cycle vary very much. It seems, however, to have stood in some relation to the cycle of the "upward and downward path" of the soul (§ 66). Herakleitos called a generation a month (fr. 88), and it is natural to suppose he meant a month of the "great year," but this seems not to be the case; for, according to Censorinus (*De die nat.* 18. 11), the latter was 10,800 years, and,

We have seen already how explicit is the testimony of Plato to the eternity and simultaneity of the differentiation of the one into many and the integration of the many into one. Nor does Zeller really succeed in explaining it away. He is compelled to add to his paraphrase of Plato's words the statement that "Herakleitos did not intend to retract this principle in his doctrine of a periodic change in the conditions of the world; if the two doctrines are not compatible, it is a contradiction which he has not observed."[66] All that need be said about this is that, if it were true, the "severer Muses" would hardly have deserved the tribute which Plato pays them, and the point of the contrast with Empedokles would be altogether lost.

Nor do the statements of Aristotle imply a universal conflagration. In the course of his discussion on infinity he takes occasion to say that, even if we do not hold, with Anaximander and Anaximenes, that there is an infinite primary substance, it is still impossible to maintain that all things are or become one thing, as Herakleitos, for instance, held that "all things at a certain time become fire."[67] Zeller makes much of this; but I cannot see that there is anything at all either in the words of Aristotle or the context in which they occur to exclude the idea that he is speaking simply of the conversion into fire, which everything periodically undergoes

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according to Aetios (ii. 32. 3), 18,000. Now, 30 × 360 = 10,800 years, so that a generation would be a *day* in the "great year" (Tannery, *Science hellène*, p. 168, *n*. 1).

[66] Zeller, p. 637 sq. (Eng. trans. ii. p. 73 sq.).

[67] *Phys.* Γ, 205*a*, 3; *Met.* K, 1067*a*, 4.

in the course of its "upward and downward" journey. Indeed, the use of the present tense seems even to make this a more natural interpretation than the other.[68] In the other passage upon which Zeller relies, Herakleitos is coupled with Empedokles as holding that the heavens are alternately as they are now and in some other condition.[69] This, however, need not mean that the Kosmos as a whole becomes fire; it is quite sufficiently accounted for if we assume that, in the course of the Great Year, a period of encroachment on the part of fire was followed by a compensatory regress, so that the "measures" are, in the long run, preserved.

Lassalle collected a number of passages from post-Aristotelian writers which contradicted, as he thought, the view that Herakleitos maintained a general conflagration of the world. There can be no doubt, however, that Zeller is right in his criticism of most of these. Nevertheless there still remain two at least which deserve notice, and which had already been insisted upon by Schleiermacher. Marcus Aurelius, who elsewhere accepts the usual interpretation of his sect, clearly shows in one place[70] that he had misgivings about it. "So that these things too," he says, "are taken up once more into the Reason of the universe (*Stoic phraseology*), whether it is by a periodical conflagration, or by a renovation effected by eternal exchanges." Lastly, Plutarch, in his dialogue called *The Failure of the Oracles*,[71] puts into the mouth of Kleombrotos, one of his personages, the following remarkable utterance: "I hear all that from many people, and I see the Stoic conflagration trespassing on the verses of Hesiod, just as it does on the writings of Herakleitos and the verses of Orpheus." These statements are all the more remarkable from their disagreement with what was the universal belief at the time they were written. They show that it was possible for careful students of the original work to find there a very different meaning from that which the Stoic "accommodators" professed to see in it.

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[68] The use of ἅπαντα instead of πάντα is by no means conclusive; nor can I see that the context decides against the interpretation I have given. It seems to me that Aristotle would most likely have said γενήσεσθαι or γίνεσθαι had he meant what Zeller supposes.

[69] *De Cœlo*, A, 279*b*, 16: οἱ δ' ἐναλλὰξ ὁτὲ μὲν οὕτως, ὁτὲ δὲ ἄλλως ἔχειν [φθειρόμενον] (sc. φασὶ τὸν κόσμον) καὶ τοῦτο ἀεὶ διατελεῖν οὕτως, ὥσπερ Ἐμπ. ὁ Ἀκρ. καὶ Ἡρ. ὁ Ἐφ.

[70] X. 7: ὥστε καὶ ταῦτα ἀναληφθῆναι εἰς τὸν τοῦ ὅλου λόγον. εἴτε κατὰ περίοδον ἐκπυρουμένου, εἴτε ἀϊδίοις ἀμοιβαῖς ἀνανεουμένου.

Correlation of opposites.

63. There are a number of Herakleitean fragments which form a class by themselves, and are among the most striking of all the utterances that have come down to us. The common characteristic of these is, that they assert in the most downright way the identity of various things which are usually regarded as opposites. The clue to the meaning of all these statements is obviously to be found in the account already given of the similar assertion that day and night are one. We have seen that Herakleitos meant to say, not that day was night or that night was day, but simply that they were two sides of the same process, namely, the oscillation of the "measures" of fire and water, and that neither would be possible without the other. Any explanation that can be given of night will also be an explanation of day, and *vice versa;* for it will be an account of that which is common to both, and manifests itself now as one and now as the other. Moreover, it is just because it has manifested itself in the one form that it must next appear in the other;

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[71] 415 F: *ἀκούω ταῦτ', ἔφη, πολλῶν καὶ ὁρῶ τὴν Στωϊκὴν ἐκπύρωσιν, ὥσπερ τὰ Ἡρακλείτου καὶ Ὀρφέως ἐπινεμομένην ἔπη, οὕτω καὶ τὰ Ἡσιόδου καὶ συνεξαπατῶσαν.*

for this is required by the law of compensation or Justice.

This is, of course, only a particular application of the universal principle that the primary fire is one even in its division. It itself is, even in its unity, both plenty and want, war and peace (fr. 36). In other words, the "satiety" which makes fire pass into other forms, which makes it seek "rest in change" (fr. 82, 83), and "hide itself" (fr. 10) in the "invisible harmony" of opposition, is only one side of the process. The other is the "want" which leads it to consume the bright vapour as fuel. The upward path is nothing without the downward (fr. 69). If either were to cease, the other would cease also, and the world would disappear; for it takes both to make an apparently stable reality.

All the other utterances of this kind are to be explained in the same way. If there were no cold, their would be no heat; for a thing can only grow warm if, and in so far as, it is already cold. And the same thing applies to the opposition of wet and dry (fr. 39). These, it will be observed, are just the two primary oppositions of Anaximander, and Herakleitos is showing that the war between them is really peace, for it is the common element in them (fr. 62) which appears as strife, and that very strife is justice, and not, as Anaximander had taught, an injustice which they commit one against the other, and which must be expiated by a reabsorption of both in their common ground.[72] The strife itself is the common ground (fr. 62), and is eternal.

The most startling of all these sayings is undoubtedly that which affirms that good and evil are the same (fr. 57). This does not mean in the least, however, that good is evil or that evil is good, but simply that they are the two inseparable halves of one and the same thing. Nor are the words used in their moral sense. He means simply that a thing can become good only in so far as it is already evil, and evil only in so far as it is already good, and that all depends on the contrast. The illustration given in fr. 58 shows this clearly enough. Torture, one would say, was an evil, and yet it is made a good by the presence of another evil, namely, disease; as is shown by the fact that surgeons actually expect a fee for inflicting it upon their patients. Justice, upon the other hand, which is a good, would be altogether unknown were it not for the existence of injustice, which is an evil (fr. 60). And this is why it is not good for men to get everything they wish (fr. 104). They might think that this would be the greatest of goods; but, just as the cessation of strife in the world at large would mean its destruction, so the disappearance of hunger, disease, and weariness would involve also the disappearance of satisfaction, health, and rest.

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[72] Chap. I. § 13.

This leads to a theory of the universal relativity of good which prepares the way for the doctrine of Protagoras, that " Man is the measure of all things."[73] Even the *reductio ad absurdum* of that doctrine (probably derived from Antisthenes), which Plato brings forward in the *Theaitetos* only to dismiss it again as a piece of eristic, is foreseen and frankly accepted by Herakleitos. Asses must judge for themselves what is good for them, and they would rather have straw than gold (fr. 51). Sea-water is good for fish and bad for men (fr. 52). Swine, for preference, wash in the mire (fr. 53); and certainly, if only you are dirty enough, that will make you relatively clean.

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[73] Plato's exposition of the theory of the relativity of knowledge in the *Theaitetos* (152 D sqq.) can hardly go back to Herakleitos himself. Plato sets himself to show how Herakleiteanism might naturally give rise to such a doctrine. If the soul is a stream and things are a stream, then of course, knowledge is relative. Very possibly the later Herakleiteans had worked out the theory in this direction, but in the days of Herakleitos himself the problem of knowledge had not yet arisen. His theory of knowledge was, no doubt, confined to the single tenet that fire is wise, and the dry soul knows best.

But, for all that, Herakleitos is not a believer in absolute relativity. There is, doubtless, great danger of our reading modern ideas upon this subject into the words of the first thinker who raised this great question; but the following statement seems to be justified by the fragments. We must bear in mind that the process of the world is not merely a circle, in which case we should have an absolute relativity, but an "upward and downward path." At the upper end, where the two paths meet, we have the pure elemental fire, in which, as there is no separation, there is no relativity. We are told expressly that, while to man some things are evil and some things are good, all things are good to God (fr. 61). Now by God there is no doubt that Herakleitos meant Fire. He also calls it the "one wise," and perhaps said that it "knows all things." I prefer, however, not to call it the Absolute, with Lassalle, for that designation obscures the fact that it is real physical fire. At the same time, there can hardly be any doubt that Herakleitos meant to say that in it the opposition and relativity which are universal in the world disappear. It is doubtless to this that fr. 96, 97, and 98 refer.

64. Herakleitos speaks of "wisdom" or the "wise" in two senses. We have seen already that he said wisdom was "something apart from everything else," meaning by it the perception of the unity of the many; The Wise.

and he also applies the term to that unity itself, regarded as the "thought that directs the course of all things." This is synonymous with the pure fire which is not differentiated into two parts, one taking the upward and the other the downward path. That alone has wisdom; the partial things we see have not. We ourselves are only wise in so far as we are fiery.

Theology. 65. With certain reservations, Herakleitos was prepared to call the one Wisdom by the name of Zeus. Such, at least, appears to be the meaning of fr. 65. What these reservations were, it is easy to guess. It is not, of course, to be pictured in the form of a man. In saying this, Herakleitos would only have been repeating what had already been laid down by Anaximander and Xenophanes. He agrees further with Xenophanes in holding that this "god," if it is to be called so, is one; though, we shall see, in another sense there are many gods, just as with Xenophanes. Herakleitos further disagrees both with Anaximander and Xenophanes in identifying god with the primary substance and not with the world. His polemic against popular religion seems to have been more thoroughgoing than that of Xenophanes, in that it was directed rather against the rites and ceremonies themselves, than against their mere mythological outgrowth. He gives a list (fr. 124) of some of the most characteristic religious figures of his time, and the context in which the fragment is quoted shows that he in some way threatened them with the wrath to come. He comments upon the absurdity of praying to images (fr. 126), and the strange idea that blood-guiltiness can be washed out by the shedding of blood (fr. 130). He seems also to have pointed out that it was absurd to celebrate the worship of Dionysos by cheerful and licentious ceremonies, while Hades was propitiated by gloomy rites (fr. 127). According to the mystic doctrine itself, the two were really one; and the one Wisdom ought to be worshipped in its integrity.

The few fragments which deal with theology and religion hardly suggest to us that Herakleitos was in sympathy with the religious revival of the time, and yet we have lately been asked to consider his system "in the light of the idea of the mysteries;"[74] and even a sensible critic like Tannery has been led, by his too complete reliance upon the ingenious but erratic Teichmüller, to treat Herakleitos mainly as a theologian. Our attention is called to the fact that he was "king" of Ephesos, that is, priest of the branch of the Eleusinian mysteries established in that city, which was also connected in some way with the worship of Artemis or the Great Mother.[75] These statements are, to say the least of it, very doubtful; but, even if they were true, what would follow? We ought surely to have learnt from Lobeck by this time that there was no "idea" in the mysteries at all; and on this point the results of recent anthropological research have abundantly confirmed those of philological and historical inquiry. The mysteries were, however, it is alleged, an elaborate symbolisation of the alternation of life and death, sleeping and waking, night and day, summer and winter. It is not explained why any one should have thought it desirable to symbolise these obvious facts. Ancient religion is very practical, and it is hard to see what was to be gained by so fantastic a proceeding. Nor is it clear that Herakleitos, or indeed any one possessed of even moderate intelligence, had to resort to mysteries to learn so simple a lesson. Teichmüller also pressed into the service the obscure sentence (fr. 127), which asserts, incidentally, the identity of Hades and Dionysos. This is explained by means of a myth which is related by St. Clement of Alexandria; but which does that Father little credit, and positively explains nothing at all.[76] It is almost a sufficient refutation of these views to point out that they have been arrived at by starting from the latest sources and the most unintelligible fragments, a method which violates every principle of sound criticism, and can therefore lead to nothing. It is surely better to start from those fragments which it is really possible to make out, and to look at the more difficult ones in the light of the results so attained. It will then be found that, while some of the obscurer fragments will still remain obscure, the theological interpretation of them is absolutely excluded. Not that Herakleitos was absolutely unaffected by the religious movement described in the last chapter; but his attitude towards it was, in the main, one of contemptuous hostility.

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[74] E. Pfleiderer, *Die Philosophie des Heraklit von Ephesus in Lichte der Mysterienidee* [1886].

[75] Antisthenes (the writer of *Successions*), ap. R. P. 24. Cf. R. P. 24*b*.

Man. 66. The world being such as we have seen, what is man? Aristotle tells us that Herakleitos regarded the soul of man as fire, since he identified it with the bright exhalation,[77] a statement which is abundantly confirmed by later writers,[78] and, as we shall see, by the fragments that have come down to us. There is, however, a possible misinterpretation of it, against which we must carefully guard. Herakleitos cannot have distinguished the soul as spiritual from the body as material. Man is made up, just like the world at large, of three things, fire, water, and earth. But, just as in the macrocosm fire is identified with the one wisdom, so in the microcosm the fire alone is conscious. When it has left the body, the remainder, the mere earth and water, is altogether worthless (fr. 85). We have here, it is true, the rudiments of the distinction between soul and body, but we have nothing more. The fire is to be regarded as material, and as of just the same nature with that which "burns and crackles" on the hearth.

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[76] I do not propose to quote this disgusting story; but, for the benefit of those who know it, it may be well to point out that "he who forgets the way" is simply the drunken man of fr. 73.

[77] *De An.* A, 2. 405*a*, 25 (R. P. 30*c*).

[78] R. P. 33*d*.

The parallelism between man and the world, of which he is a part, is in every way complete. The fire which animates him is subject to the "upward and downward path," just as much as the fire of the world. The *Περὶ διαίτης* has preserved the obviously Herakleitean sentence: "All things are passing, both human and divine, upwards and downwards."[79] We are just as much in perpetual flux as anything else in the world. We are and are not the same for two consecutive instants (fr. 84). The fire in us is perpetually becoming water, and the water earth; but, as the opposite process goes on simultaneously we appear to remain the same.[80]

Sleep and death.

67. This, however, is not all. Like the world, man

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[79] I. 5 (p. 62, 21, Byw.).

[80] We seem to have a clear reference to this in Epicharmos (ap. D. L. iii. 10): "Look now at men too. One grows and another passes away, and all are in change always. What changes in its substance and never abides in the same spot, will already be something different from what has passed away. So thou and I were different yesterday, and are now quite other people, and again we shall become others and never the same again, and so on in the same way." This is put into the mouth of a debtor who does not wish to pay. See Bernays on the *αὐξανόμενος λόγος* (*Ges. Abh.* i. p. 109 sqq.).

is subject to a certain oscillation in his "measures" of fire and water, and this gives rise to the alternations of sleeping and waking, life and death. The *locus classicus* on this subject is a passage of Sextus Empiricus, which reproduces the account of the Herakleitean psychology given by Ainesidemos (Skeptic, *c.* B.C. 80–A.D. 50).[81] It is as follows (R. P. 33):—

> The natural philosopher is of opinion that what surrounds us[82] is rational and endowed with consciousness. According to Herakleitos, when we draw in this divine reason by means of respiration, we become conscious. In sleep we forget, but at our waking we become conscious once more. For in sleep, when the openings of the senses close, the mind which is in us is cut off from contact with that which surrounds us, and only our connexion with it by means of respiration is preserved as a sort of root (from which the rest may spring again); and, when it is thus separated, it loses the power of memory that it had before. When we awake again, however, it looks out through the openings of the senses, as if through windows, and coming together with the surrounding mind, it assumes the power of reason. Just, then, as embers, when they are brought near the fire, change and become red-hot, and go out when they are taken away from it again, so does the portion of the surrounding mind which sojourns in our body become irrational when it is cut off, and so does it become of like nature to the whole when contact is established through the greatest number of openings.

In this passage there is obviously a very large admixture of later phraseology and of later ideas. In particular, the identification of "that which surrounds us" with the air cannot be Herakleitean; for Herakleitos can have known nothing of air, which in his day was identified with mist (§ 26). The reference to the pores or openings of the senses is probably foreign to Herakleitos also; for this was an idea first started by Empedokles (§ 95). Lastly, the distinction between mind and body is far too sharply drawn. On the other hand, the important rôle assigned to respiration may very well be Herakleitean; for we have met with it already in Anaximenes. And we can hardly doubt that the striking simile of the embers which glow when they are brought near the fire is genuine (cf. fr. 77). The true Herakleitean doctrine doubtless was, that sleep was produced by the encroachment of moist, dark exhalations from the water in the body which cause the fire to burn low. In a soul where the fire and water were evenly balanced, the equilibrium would be restored in the morning by an equal encroachment of the fire upon the water.

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[81] Sextus quotes "Ainesidemos according to Herakleitos." Natorp holds (*Forschungen*, p. 78) that Ainesidemos really did combine Herakleiteanism with Skepticism. Diels, on the other hand (*Dox.* pp. 210, 211), insists that Ainesidemos only gave an account of the theories of Herakleitos. This controversy does not affect the use we make of the passage.

[82] Τὸ περιέχον ἡμᾶς, opposed to but parallel with τὸ περιέχον τὸν κόσμον.

But in no soul are the fire and water thus evenly balanced for long. One or the other acquires a decisive predominance, and the result in either case is death. Let us take each of these cases in turn. It is death, we know, to souls to become water (fr. 68); but this is just what happens to souls which seek after pleasure. For pleasure is a moistening of the soul (fr. 72), as may be seen in the case of the drunken man, who, in pursuit of it, has moistened his soul to such an extent that he does not know where he is going (fr. 73). Even in gentle relaxation over our cups, it is more difficult to hide folly than at other times (fr. 108). This is why it is so necessary for us to quench wantonness (fr. 103); for whatever our heart's desire insists upon it purchases at the price of our life, that is, of the fire within us (fr. 105). Take now the other case. The dry soul, that which has least moisture, is the best (fr. 74); but the preponderance of fire causes death as much as that of water. It is, however, a very different death, and wins "greater portions" for those who die it (fr. 101). Apparently those who fall in battle share this fate (fr. 102). We have no fragment which tells us directly what it is, but we shall see that the class of utterances which we are about to look at next leaves little doubt upon the subject. Those who die the fiery and not the watery death, become, in fact, gods, though in a different sense from that in which the one Wisdom is god. It is probable that the corrupt fragment 123 refers to this unexpected fate that awaits men when they die.[33]

Man's Upward and Downward path.

68. We have not even yet got to the end. Just as summer and winter are one, and necessarily reproduce one another by their "opposite tension," so do life and death. They, too, are one, we are told; and so are youth and age. It follows that the same soul will be now living and now dead; that it will only turn to fire or water, as the case may be, to recommence once more its unceasing upward and downward path. The soul that has died from excess of moisture sinks down to earth; but from the earth comes water, and from water is once more exhaled a soul (fr. 68). So, too, we are told (fr. 67) that gods and men are really one. They live each other's life, and die each other's death. Those mortals that die the fiery death become immortal, they become the guardians of the quick and the dead (fr. 123); and those immortals become mortal in their turn. Every-

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[33] We need not hesitate to ascribe to Herakleitos the view that the dead become guardian demons of the living; it appears already in Hesiod, *Works and Days*, 121. As Bernays pointed out (*Her. Br.* p. 38 sq.), the theory expounded by Plato in *Phaido*. 72 A, is simply a development of this. Plato had been a Herakleitean in his youth.

thing is really the death of something else (fr. 64). The living and the dead are continually changing places (fr. 78), like the pieces in a child's game of draughts (fr. 79).

But why should those who have become gods consent to sink once more into human life? For the same reason, says Herakleitos, as fire is always in motion, namely, satiety, which is also want, and the impossibility of enjoying good without evil. The real weariness is continuance in the self-same state (fr. 82), and the real rest is change (fr. 83). Rest in any other sense than this would be tantamount to dissolution (fr. 84). So they are born once more, and the cycle is repeated.

This cycle, according to Herakleitos, might be gone through in the course of three generations. A man might reappear as his own grandchild even in the short space of thirty years (fr. 87–89).

Before leaving this subject, we must say a few words on two of the most obscure fragments of Herakleitos (37 and 38). These seem to be correlative, and to mean that while, on the one hand, if all things became vapour, the sense of smell would still have an object; on the other, when man himself becomes vapour, he still retains that sense. I think the clue to these curious statements is to be found in what Theophrastos tells us of the probably Pythagorean view reported by Parmenides in the second part of his poem. According to this, even dead bodies, which consist solely of the dark element, retained a perception of everything silent, cold, and dark.[84] In the same way, Herakleitos seems to say that the fiery part of man, when separated from the earth and water, retains a perception of what is fiery. Now the fiery element is perceived primarily by the sense of smell, and therefore that is retained even by what we should call "disembodied souls." Similarly, if *per impossibile* all things were to revert to the unity of fire, the sense of smell would still have an object upon which to exercise itself. It must be admitted, however, that all this is extremely doubtful.

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[84] Chap. IV. *n.* 56.

Ethics of Herakleitos.

69. In his *History of Ethics*[85] Köstlin rightly insists upon the importance of the moral teaching of Herakleitos. Unfortunately, however, he has been misled by Schuster into reducing it to something like a "common-sense" theory of Ethics. The "common" upon which Herakleitos insists is, nevertheless, something very different from public opinion, for which, indeed, he had the greatest possible contempt (fr. 111). It is, in fact, his strongest objection to "the many," that they live each in his own world (fr. 95), as if they had a private wisdom of their own (fr. 92); and public opinion is therefore just the opposite of "the common."

The Ethics of Herakleitos are to be regarded as a corollary of his anthropological and cosmological views. Their chief requirement is that we keep our souls dry, and thus assimilate them to the one Wisdom, which is fire. This is what is really "common," and the greatest fault is to act like men asleep (fr. 94), that is, by letting our souls grow moist, to cut ourselves off from communion with the reason in the world, conceived in the naively materialistic way with which we are now familiar. We do not know what were the consequences which Herakleitos deduced from his rule that we must hold fast to what is common, but it is easy to see what their nature must have been. The wise man would not try to secure good without its correlative evil. He would not seek for rest without exertion, nor expect to enjoy contentment without first suffering discontent. He would not complain that he had to take the bad with the good, but would consistently look at things as a whole.

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[85] *Gesch. d. Ethik*, i. p. 160 sqq.

Herakleitos prepared the way for the Stoic world-state by comparing "the common" to the laws of a city. And these are even more than a type of the divine law; they are imperfect embodiments of it. They cannot, however, exhaust it altogether; for in all human affairs there is an element of relativity (fr. 91). "Man is a baby compared to God." Such as they are, however, the city must fight for them as for its walls; and, if it has the good fortune to possess a citizen who has a really dry soul, he is really as good as ten thousand (fr. 113); for in him alone is "the common" embodied.

CHAPTER IV.

PARMENIDES OF ELEA.

Life. 70. PARMENIDES, son of Pyres, was a citizen of Hyele, Elea, or Velia, a colony founded in Oinotria by refugees from Phokaia in 536 B.C.[1] His date is not easily fixed with certainty. Diogenes tells us that he "flourished" in Ol. LXIX. (504–501 B.C.); and this was doubtless the date given by Apollodoros.[2] On the other hand, Plato says quite distinctly that Parmenides came to Athens in his sixty-fifth year, accompanied by Zeno, and conversed with Sokrates, who was then quite young.[3] Now Sokrates was just over seventy when he was put to death in 399 B.C.; and therefore, if we suppose him to have been an *ephebos*, that is, from eighteen to twenty years old, at the time of his interview with Parmenides, we get 451–449 B.C. as the date of that event. I do not hesitate to accept this,[4] especially as the year given by Diogenes would make the birth of Parmenides some years earlier than the foundation of Elea, of which city he is said to have been a native. I cannot explain the origin of the mistake. Diels holds that Apollodoros merely synchronised Parmenides with Herakleitos, but it is very strange that he should have neglected the data furnished by Plato.

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[1] R. P. 91. For the foundation of Elea, see Herod. i. 165 sqq. It was on the coast of Lucania, south of Poseidonia (Pæstum).

[2] D. L. ix. 23 (R. P. 91). Cf. Diels, *Rhein. Mus.* xxxi. 34.

[3] *Parm.* 127 B (R. P. 91*d*).

[4] I cannot believe that the interview of Sokrates with Parmenides is a mere figment of Plato's, though, of course, the dialogue reported is purely imaginary. Had Plato brought the two men together for purely dramatic purposes, he would hardly have invited criticism by giving exact figures as to the ages of Parmenides and Zeno. Nor would he have referred to the meeting in two other passages of his works (*Soph.* 217 C, and *Theait.* 183 E).

We have seen already (§ 43) that Aristotle records a tradition which made Parmenides the disciple of Xenophanes; but the value of this testimony is diminished by the doubtful way he speaks. It is clear that he had no authentic information on the point. It is, we also saw, very unlikely that Xenophanes actually founded the school of Elea, though it is quite possible he visited that city. He tells us himself that, in his ninety-second year, he was still wandering up and down (fr. 24). At that time Parmenides would be well advanced in life. Nor was Xenophanes at all the sort of man whom we should expect to find gathering disciples round him and establishing a school. More probably his influence on Parmenides, if he really had any, was of a different kind. His vigorous satire may have awakened in the mind of the younger man that dissatisfaction with Pythagorean dualism which, as we shall see, was his starting-point. And we must not overlook the statement of Sotion, preserved to us by Diogenes, that, though Parmenides "heard" Xenophanes, he did not "follow" him. According to this account, our philosopher was the "associate" of two Pythagoreans, Ameinias and Diochaites, "a poor but noble man to whom he afterwards built a shrine as to a hero." It was Ameinias and not Xenophanes that "converted" Parmenides to the philosophic life.[5] This has undoubtedly the air of a trustworthy tradition, and the shrine erected by Parmenides may well have been extant later to bear witness to it. It should also be mentioned that Strabo describes Parmenides and Zeno as Pythagoreans, and that Kebes talks of a "Parmenidean and Pythagorean way of life."[6] Zeller explains all this by supposing that, like Empedokles, Parmenides approved of and followed the Pythagorean mode of life without adopting the Pythagorean system. It is possibly true that Parmenides believed in a "philosophic life" (§ 33), and that he got the idea from the Pythagoreans; but there is absolutely no trace, either in his writings or in what we are told about him, of his having been in any way affected permanently by the superstitious elements in Pythagoreanism. The writing of Empedokles is obviously modelled upon that of Parmenides, and yet there is an impassable gulf between the two. The touch of charlatanism, which is such an unpleasant feature in the copy, is altogether absent from the model. It is true, no doubt, as O. Kern has pointed out, that there are traces of Orphic ideas in the poem of Parmenides;[7] but they are all to be found either in the allegorical introduction, or in the second part of the poem; and we need not therefore believe they were taken very seriously. Now Parmenides was a western Hellene, and had probably been a Pythagorean. It is therefore not a little remarkable that he should be so free from the common faults of his age and country. As regards the relation of Parmenides to the Pythagorean system, we shall have something to say later on. At

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[5] D. L. ix. 21 (R. P. 91). Sotion, in his *Successions*, separated Parmenides from Xenophanes and associated him with the Pythagoreans (*Dox.* 146–148), and D. L. follows him here (*Dox.* p. 166).

[6] Strabo, *Geog.* vi. 1; Keb. *Tab.* 2 (R. P. 91c). Kebes was probably the (Pythagorising) cynic (Chap. II. *n.* 42) mentioned by Ath. *Deipn.* 156 D (Sittl. *Gr. Litt.* ii. 276).

[7] *Zu Parmenides, Arch.* iii. p. 173 sqq.: Δίκη πολύποινος (v. 14) and the δώματα νυκτός are distinctly Orphic.

present we need only note further that, like most of the oldest philosophers, he took part in politics; and Speusippos recorded that the magistrates of Elea made the citizens swear every year to abide by the laws which Parmenides had given them.[8]

The poem.

71. Parmenides was really the first philosopher to expound his system in metrical language. As there is a good deal of confusion on this subject, it deserves a few words of explanation. In writing of Empedokles, Mr. J. A. Symonds says: "The age in which he lived had not yet thrown off the form of poetry in philosophical composition. Even Parmenides had committed his austere theories to hexameter verse." Now this is altogether wrongly put. The earliest philosophers, Anaximander, Anaximenes, and Herakleitos, all wrote in prose, or what they meant for prose, and the only Greeks who ever wrote philosophy in verse at all were just these two, Parmenides and Empedokles; for Xenophanes was not primarily a philosopher any more than Epicharmos. Empedokles copied Parmenides; and he, no doubt, was influenced by the writings of Xenophanes. But the thing was an innovation, and one which luckily did not maintain itself.

The fragments of Parmenides are preserved for the most part by Simplicius, who fortunately inserted them in his commentary, because in his time the original work was already rare.[9] I follow the arrangement of Karsten, adopting, however, the improved text of Diels.

The steeds that bear me carried me as far as ever my heart desired, since they brought me and set me on the renowned way of the goddess, who with her own hands conducts the man who knows through all things. On what way was I borne along; for on it did the wise steeds carry me, drawing my car, and maidens showed the way. And the axle, glowing in the socket—for it was urged round by the whirling wheels at each end—gave forth a sound as of a pipe, when the daughters of the Sun, hasting to convey me into the light, threw back their veils from off their faces and left the abode of Night.

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[8] Ap. D. L. ix. 23 (R. P. 91). Cf. Strabo, vi. 1 (R. P. 91c).

[9] Simpl. *Phys.* 144, 25 D (R. P. 95).

There are the gates of the ways of Night and Day, fitted above with a lintel and below with a threshold of stone. They themselves, high in the air, are closed by mighty doors, and Avenging Justice keeps the keys that open them. Her did the maidens entreat with gentle words and skilfully persuade to unfasten without demur the bolted bars from the gates. Then, when the doors were thrown back, they disclosed a wide opening, when their brazen hinges swung backwards in the sockets fastened with rivets and nails. Straight through them, on the broad way, did the maidens guide the horses and the car, and the goddess greeted me kindly, and took my right hand in hers, and spake to me these words:—

"Welcome, noble youth, that comest to my abode on the car that bears thee tended by immortal charioteers! It is no ill chance, but justice and right that has sent thee forth to travel on this way. Far, indeed, does it lie from the beaten track of men! Meet it is that thou shouldst learn all things, as well the unshaken heart of persuasive truth, as the opinions of mortals in which is no true belief at all. Yet none the less shalt thou learn of these things also, since thou must judge approvedly of the things that seem to men as thou goest through all things in thy journey." R. P. 93.

THE WAY OF TRUTH.

Come now, I will tell thee—and do thou hearken to my saying and carry it away—the only two ways of search that can be thought of. The first, namely, that *It is*, and that it is impossible for anything not to be, is the way of conviction, for truth is its companion. The other, namely, that *It is not*, and that something must needs not be,—that, I tell thee, is a wholly untrustworthy path. For you cannot know what is not—that is impossible—nor utter it; for it is the same thing that can be thought and that can be.[10] R. P. 94*a*.

It needs must be that what can be thought and spoken of is; for it is possible for it to be, and it is not possible for what is nothing to be. This is what I bid thee ponder. I hold thee back from this first way of inquiry, and from this other also, upon which mortals knowing naught wander in two minds; for hesitation guides the wandering thought in their breasts, so that they are borne along stupefied like men deaf and blind. Undiscerning crowds, in whose eyes the same thing and not the same is and is not, and all things travel in opposite directions![11] R. P. 94*b*.

For this shall never be proved, that the things that are not are; and do thou restrain thy thought from this way of inquiry. Nor let habit force thee to cast a wandering eye upon this devious track, or to turn thither thy resounding ear or thy tongue; but do thou judge the subtle refutation of their discourse uttered by me.[12] One path only is left for us to speak of, namely, that *It is*. In it are very many tokens that what is, is uncreated and indestructible, alone, complete,[13] immovable and without end. Nor was it ever, nor will it be; for now *it is*, all at once, a continuous one. For what kind of origin for it will you look for? In what way and from what source could it have drawn its increase? I shall not let thee say nor think that it came from what is not; for it can neither be thought nor uttered that what is not is. And, if it came from nothing, what need could have made it arise later rather than sooner? Therefore must it either be altogether or be not at all. Nor will the force of truth suffer aught to arise besides itself from that which in any way is. Wherefore, Justice does not loose her fetters and let anything come into being or pass away, but holds it fast. R. P. 94C–95.

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[10] This is how Zeller takes these much disputed words. For the construction, cf. *εἰσὶ νοῆσαι* (v. 34), *ἔστι γὰρ εἶναι* (v. 43), *τὸ λέγειν τε νοεῖν τ' ἐόν* (*ib.*). We read, of course, *ἔστιν* not *ἐστίν*, with Zeller, 512, *n*. 1 (Eng. trans. i. 584, *n*. 1).

[11] In v. 44 I read *μηδὲν δ' οὐκ ἔστιν* with Simplicius, and understand *εἶναι* after it. The *παλίντροπος κέλευθος* has, I believe, nothing to do with the *παλίντονος ἁρμονίη*, but is a rendering of *ὁδὸς ἄνω κάτω*. Zeller doubts the reference to Herakleitos here, mainly on chronological grounds. We have seen, however, that Herakleitos may very well be earlier than he allows (§ 50). See Bernays, *Ges. Abh.* i. 62, *n*. 1, and Diels, *Philosophenschulen*, p. 225.

[12] I read *πολύδηριν* with Karsten, and *λόγων* for *λόγῳ*. *Λόγος* does not mean "reason" as opposed to sense.

[13] I read *μουνόν τ' οὐλομελές* instead of *οὖλον μουνογενές*. Plutarch (*adv. Col.* 1114 D) gives *ἔστι γὰρ οὐλομελές*, which points to this; and Simplicius more than once applies the term *ὁλομελές* to the *ἐόν* of Parmenides (*e.g. Phys.* 137, 15 D). The epithet *μουνογενές* would surely be an anachronism; it comes from Plato's *Timaios*, 31 B, where it has its proper force.

"*Is it* or *is it not?*" Surely it is adjudged, as it needs must be, that we are to set aside the one way as unthinkable and nameless (for it is no true way), and that the other path is real and true. How, then, can what *is* be going to be in the future? Or how could it come into being? If it came into being, it is not; nor is it if it is going to be in the future. Thus is becoming extinguished and passing away not to be heard of. R. P. 95*c*.

Nor is it divisible, since it is all alike, and there is no more of it in one place than in another, to hinder it from holding together, nor less of it, but everything is full of what is. Wherefore all holds together; for what is, is in contact with what is.

Moreover, it is immovable in the bonds of mighty chains, without beginning and without end; since coming into being and passing away have been driven afar, and true belief has cast them away. It is the same, and it rests in the self-same place, abiding in itself. And thus it remaineth constant in its place; for hard necessity keeps it in the bonds of the limit that holds it fast on every side. Wherefore it is not permitted to what is to be infinite; for it is in need of nothing; while, if it were infinite, it would stand in need of everything.[14] R. P. 96.

Look steadfastly with thy mind at things afar as if they were at hand. You cannot cut off what anywhere is from holding fast to what is anywhere; neither is it scattered abroad throughout the universe, nor does it come together. R. P. 96*a*.

It is the same thing that can be thought and for the sake of which the thought exists; for you cannot find thought without something that is, to which it is betrothed.[15] And there is not, and never shall be, any time other than that which is present, since fate has chained it so as to be whole and immovable. Wherefore all these things are but the names which mortals have given, believing them to be true—coming into being and passing away, being and not being, change of place and alteration of bright colour. R. P. 97.

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[14] I cannot restore this line. Simplicius gives μὴ ἐὸν δ' ἂν παντὸς ἐδεῖτο, which is metrically impossible. In the rendering I have given I follow Zeller, though with many doubts.

Where, then, it has its farthest boundary, it is complete on every side, equally poised from the centre in every direction, like the mass of a rounded sphere; for it cannot be greater or smaller in one place than in another. For there is nothing which is not that could keep it from reaching out equally, nor is it possible that there should be more of what is in this place and less in that, since it is all inviolable. For, since it is equal in all directions, it is equally confined within limits. R. P. 98.

THE WAY OF OPINION.

Here shall I close my trustworthy speech and thought about the truth. Henceforward learn the opinions of mortals, giving ear to the deceptive ordering of my words.

Mortals have settled in their minds to speak of two forms, one of which they should have left out,[16] and that is where they go astray from the truth. They have assigned an opposite substance to each, and marks distinct from one another. To the one they allot the fire of heaven, light, thin, in every direction the same as itself, but not the same as the other. The other is opposite to it, dark night, a compact and heavy body. Of these I tell thee the whole arrangement as it seems to men, in order that no mortal may surpass thee in knowledge. R. P. 99.

Now that all things have been named light and night, and the things which belong to the power of each have been assigned to these things and to those, everything is full at once

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[15] See above, *n.* 3. The meaning given to πεφατισμένον is only a suggestion (Steph. *Thes. s.v.*). I can make nothing of the other renderings proposed.

[16] Supplying ὀνομάζειν after οὐ χρεών ἐστι. This seems obvious; but those who hold that Parmenides is here expressing his own views are obliged to render "one of which it is wrong to speak of without the other." So Simpl. *Phys.* 31, 16 D.

125 of light and dark night, both equal, since neither has aught to
do with the other. R. P. 100.

. . . .

The narrower circles are filled with unmixed fire, and those
surrounding them with night, and in the midst of these rushes
their portion of fire. In the midst of these circles is the
divinity that directs the course of all things; for she rules over
130 all painful birth and all begetting, driving the female to the
embrace of the male, and the male to that of the female.
R. P. 101 A.

First of all the gods she contrived Eros. R. P. *ib.*

. . . .

And thou shalt know[17] the origin of all the things on high, and
135 all the signs in the sky, and the resplendent works of the
glowing sun's clear torch, and whence they arose. And thou
shalt learn likewise of the wandering deeds of the round-faced
moon, and of her origin. Thou shalt know, too, the heavens
that surround us, whence they arose, and how Necessity took
140 them and bound them to keep the limits of the stars . . . how
the earth, and the sun, and the moon, and the sky that is
common to all, and the Milky Way, and the outermost Olympos,
and the burning might of the stars arose. R. P. 101 B, C.

. . . .

Shining by night with borrowed light, wandering round the
earth.
145 Always straining her eyes to the beams of the sun.

. . . .

For as at any time is the condition of the flexible limbs, so is the state of men's minds; for that which thinks is the same, namely, the substance of the limbs, in each and every man; for their thought is that of which there is most in them.[18] R. P. 102 B.

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[17] Stein ascribes these verses to Empedokles.

[18] This fragment of the theory of knowledge which was expounded in the second part of the poem of Parmenides must be taken in connexion with what we are told by Theophrastos in the *Fragment on Sensation* (*Dox.* p. 499, cf. *n.* 32). It appears from this that he laid down that the character of men's thought depended upon the preponderance of the light or the dark element in their bodies. They are wise when the light element predominates, and foolish when the dark gets the upper hand. Ver. 150 refers to the theory of generation; see below, § 79.

. . . .

On the right boys; on the left girls. 150

. . . .

Thus, according to men's opinions, did things come into being, and thus they are now. In time (they think) they will grow up and pass away. To each of these things men have assigned a fixed name. R. P. 102*d*.

"It is."

72. In the First Part of his poem, we find Parmenides chiefly interested to prove that *It is;* but it is not quite obvious at first sight what it is precisely that *is*. He says simply, *What is, is.* To us this does not seem very clear, and that for two reasons. In the first place, we should probably never think of doubting it, and we cannot, therefore, understand why it should be asserted with such iteration and vigour. In the second place, we are accustomed to all sorts of distinctions between different kinds and degrees of reality, and we do not see which of these is meant. Does Parmenides refer to the world of sense or the world of ideas; concrete existence or abstract being; matter or spirit? Now, we have already seen more than once that all these questions would have been absolutely meaningless to an early Greek philosopher, and the system of Parmenides is the best touchstone for our understanding of this fundamental historical truth. "That which is," with Parmenides, is primarily what, in popular language, we call matter or body; only it is not matter as distinguished from anything else. It is certainly regarded as spatially extended; for it is quite seriously spoken of as a sphere (v. 102 sqq.). Moreover, Aristotle tells us that Parmenides believed in none but a sensible reality, which does not mean with him a reality actually perceived by the senses, but one which might be so perceived if the senses were more perfect

than they are.[19] The assertion that *It is* amounts, then, to this, that the universe is a *plenum;* and that there is no such thing as empty space, either inside or outside the world. From this it follows at once that there can be no such thing as motion. Instead of endowing the One of Xenophanes with an impulse to change, as Herakleitos had done, and thus making it capable of explaining the world, Parmenides dismissed change as an illusion. He showed once for all that if you take the One seriously you are bound to deny everything else. All previous solutions of the question, therefore, had missed the point. Anaximenes, who thought to save the unity of the primary substance by his theory of rarefaction and condensation, did not observe that, by assuming there was less of what is in one place than another, he virtually affirmed the existence of what is not, or empty space (v. 78 sqq.). The Pythagorean explanation implied that empty space or air existed outside the world, and that it entered into it to divide the different substances (§ 42). It, too, assumes the existence of what is not. Nor is the theory of Herakleitos any more satisfactory; for it is based upon the contradiction that fire both is and is not (v. 46 sqq.).

The allusion to Herakleitos in the verses last referred to has been doubted; though, it would seem, upon insufficient grounds. Zeller points out quite rightly that Herakleitos never says that Being and not-Being are the same (the common translation of v. 50); and, were there nothing more than this, the reference might well seem dubious. The statement, however, that, according to the view in question, "all things travel in opposite directions" (v. 51), can hardly be understood of anything but the "upward and downward path," the "race in opposite directions" of Herakleitos (§ 58). It therefore seems worth while to point out that Parmenides does not attribute the view that Being and not-Being are the same to the philosopher whom he is attacking. He means simply that, in the eyes of some people, "what is," that is to say the primary substance, both is and is not, that it is at once the same and not the same. This is the natural meaning of the words; and it furnishes a very accurate description of the theory of Herakleitos, that fire was one in all its differences, and that it remained the same though it passed into other forms, namely, water and earth. At the same time, it is quite wrong to say that the system of Parmenides was constructed in opposition to that of Herakleitos.

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[19] See Bäumker, *Die Einheit des Parmenideischen Seiendes* (*Jahrb. f. klass. Phil.* [1886] p. 541 sqq.), and *Das Probl. d. Mat.* p. 50 sqq. For the statement of Aristotle, cf. *De Cælo*, Γ, 1. 298*b*, 21. The Neo-platonists, of course, saw in the One of Parmenides their own "intelligible world," and from this point of view Simplicius (*Phys.* 146, 31 D) calls the spherical form a "mythical figment." Eudemos, however, had quite correctly explained that Parmenides meant to speak of the material universe (*οὐρανός*); cf. fr. 12 (Spengel), ap. Simpl. *Phys.* 133, 25 D. "The Being of which Parmenides speaks is the very same Being of which our senses present us with a deceptive image" (Bäumker).

The method of Parmenides.

73. The great novelty in the poem of Parmenides is the method of argument. He first asks what is the common presupposition of all the views with which he has to deal, and he finds that this is the existence of empty space. The next question is whether this can be thought, and the answer is that it cannot. If you think at all, you must think of something. Empty space is nothing, and you cannot think of nothing. Therefore empty space does not exist. Philosophy had not yet learned to make the suicidal admission that a thing might be unthinkable and nevertheless exist. Only

that can be which can be thought (v. 40); for thought exists for the sake of what is (v. 94).

This method Parmenides carries out with the utmost rigour. He will not have us pretend that we think what we must admit to be unthinkable. It is true that if we resolve to allow nothing but what we can understand, we come into direct conflict with the evidence of our senses, which present us with a world of change and decay. So much the worse for the senses, says Parmenides (v. 52 sqq.). To many this will doubtless seem a fatal mistake on his part, but let us see what history has to say on the point. The theory of Parmenides is the inevitable outcome of a monistic materialism, and his bold declaration of this fact destroyed that theory for ever. If he had lacked courage to work out the prevailing views of his time to their logical conclusion, and to accept that conclusion, however paradoxical it might seem to be, men might have gone on in the endless circle of opposition, rarefaction, and condensation, one and many, for ever. It was the thoroughgoing dialectic of Parmenides that made progress possible. Philosophy must now cease to be monistic or cease to be materialistic. It could not cease to be materialistic; for the incorporeal was still unknown. It therefore ceased to be monistic, and arrived at the atomic theory, which, so far as we know, is the last word of the view that the world is matter in motion. Having worked out its problems on those conditions, philosophy next attacked them on the other side. It ceased to be materialistic, and found it possible to be monistic once more, at least for a time. The progress would have been impossible but for that faith in reason which gave Parmenides the courage to reject as untrue what was to him unthinkable, however strange the result might be. And, even from his own point of view, he was right. The unthinkable always remains unthinkable, and nothing can be gained by pretending to admit its truth. It is true that if we refuse to allow the truth of what cannot be thought we have to leave out a great deal of reality, and our theory will therefore be partial. In that respect, however, it will only share the common lot of all things human, and that we cannot mend. What does concern us most is that, if we persist in pretending to hold beliefs which cannot be thought, our theory will be just as partial, and it will, besides, be certainly untrue from top to bottom; while, if we hold to what we can think, it will be partial, indeed, but a part of the truth. We cannot take more of reality into our view of the world than it already contains except by learning to regard the data in a new way, and this we can do only if we have first thought out what we know already to its logical conclusion.

The results.

74. Parmenides goes on to develop all the consequences of the admission that *It is.* It must be uncreated and indestructible. It cannot have arisen out of nothing; for there is no such thing as nothing. Nor can it have arisen from something; for there is no room for anything but itself. What is cannot have beside it any empty space in which something else might arise; for empty space is nothing, nothing cannot be thought, and therefore cannot exist. What is, never came into being, nor is anything going to come into being in the future. "Is it or is it not?" If it is, then it is now, all at once. Time is a mere figment (v. 96 sq.).

That Parmenides was really denying the existence of empty space, and not maintaining a theory of abstract

Being, was quite well known to Plato. He says[20] that Parmenides held "all things were one, and that the one remains at rest in itself, *having no place in which to move.*" Aristotle is no less clear. In the *De Cælo*[21] he lays it down that Parmenides was driven to take up the position that the One was immovable just because no one had yet imagined that there was any reality other than sensible reality.

That which is, is; and it cannot be more or less. There is, therefore, as much of it in one place as in another, and the world is a continuous, indivisible *plenum*. From this it follows at once that it must be immovable. If it moved, it must move into an empty space, and there is no empty space. It is hemmed in by *what is*, by the real, on every side. For the same reason, it must be finite, and can have nothing beyond it. It is complete in itself, and has no need to stretch out indefinitely into an empty space which does not exist. Hence, too, it is spherical. It is equally real in every direction, and the sphere is the only form which meets this condition. Any other would *be* in one direction more than in another. And this sphere cannot even move round its own axis; for there is nothing outside of it with reference to which it could be said to move.

nenides father of erialism.

75. To sum up. What *is*, is a finite, spherical, motionless corporeal *plenum*, and there is nothing beyond it. The appearances of multiplicity and motion, empty space and time, are illusions. We see from this that the primary substance of which the early cosmologists were in search has now become a sort of "thing in itself." It never quite lost this character again. What appears later as the elements of Empedokles, the so-called

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[20] *Theait.* 180 E.

[21] Γ, 1. 298*b*, 21.

"homoeomeries" of Anaxagoras and the atoms of Leukippos and Demokritos, is just the Parmenidean "Being." Parmenides is not, as some have said, "the father of idealism;" on the contrary, all materialism depends upon his view of reality.

The opinions of men.

76. It is commonly said that, in the Second Part of his poem, Parmenides offers a dualistic theory of things as his own conjectural explanation of the actual, sensible world.[22] This view is derived ultimately from the Aristotelian commentators, who saw in the *Way of Truth* a discussion of the Neoplatonist "intelligible world," and in the *Way of Opinion* an explanation of the "sensible world." With his usual clear-sightedness, Alexander of Aphrodisias, indeed, seems to have taken a more reasonable view of what Parmenides really meant; but Simplicius argues against him with much earnestness and ingenuity.[23]

It need hardly be said that such subtleties were as far as possible from the mind of Parmenides himself. He lays it down in the most unequivocal manner that there is no truth at all in the cosmology of the *Way of Opinion*; and he gives it, not as his own hypothesis, but simply as the belief of "mortals," that is to say, of his contemporaries. Now, those who held views of this kind were not the Milesians, certainly, nor Herakleitos; for these were monists like Parmenides himself. Still less can they be ordinary, unphilosophical people; it is true that the theory is based upon ordinary sense-perception, but nevertheless the mass of men are very far indeed from believing in a systematic cosmology such as that here expounded. No one seems to be left but the Pythagoreans; and, in fact, as was shown by Krische,[24] many of the details unquestionably do belong to the cosmology of that sect. We shall come back to this presently; meanwhile we must try to find an answer to the very natural question why Parmenides thought it worth while to put into hexameter verses a view of the world which he believed to be radically false. Here again we have only to look at what he says himself, and the solution will be apparent. It was, he tells us (v. 31), in order that the reader might be in a position to criticise and refute the rival theory. In other words, Parmenides was, as we have seen, a dialectician, and he finds it necessary to work out the opposite view, for just the same reason that Plato found it necessary to write in dialogue. The philosophy of Parmenides is, in some sort, a critical philosophy, and criticism must have an object. Of course he admitted that men really are subject to all the illusions which their senses present to them. He held it to be of vital importance that they should get behind these and come in contact with the real truth of things. Further, this was to be done by argument, by dialectic. It was, therefore, of importance to know these illusions thoroughly; and, to this end, it was well to take the most coherent account of them that had been given. That Parmenides, living at the time he did, and in Southern Italy, should have looked upon the Pythagorean system as the final explanation of the world that could be given from the false standpoint of the senses, is only natural. We may therefore hope to get from him some information as to what Pythagoreanism really was in his day, and thus both to supplement what was said in Chap. II. and to prepare for the inquiry which will occupy us in Chap. VII.

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[22] The view in question derives some support from the expressions of Aristotle. He certainly says that P. was compelled to accommodate himself to appearances, and to assume that while reality was one according to reasoning, it was many according to sense (*Met.* A, 5. 986*b*, 31). He also attributes the dualist cosmology of the Second Part to Parmenides himself in a number of places (*e.g.* *Phys.* A, 5. 188*a*, 20); but that is a very natural manner of speaking in any case. We must remember that the distinction between the world as it is for thought and the world as it is for sense was first clearly established by Plato.

[23] Simpl. *Phys.* 38, 24 sqq. D.

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[24] *Forschungen*, pp. 97–116, where the passage of Aetios about to be quoted is admirably discussed. Diels (*Ueber die ältesten Philosophenschulen der Griechen*, in *Philos. Aufs. Ed. Zeller gewidmet*, p. 253) objects to Tannery's revival of this theory on the ground that the two "forms" of Parmenides may be identified with the Warm and the Cold of Anaximander, or the Rare and the Dense of Anaximenes; but the dualism of the theory seems much too fundamental and decided for that. In his *Empedokles und Gorgias* (*Sitzungsber. der Berl. Akad.* 1884, p. 352), Diels now speaks of Parmenides as "strongly Pythagorising in his Δόξα."

The dualist cosmology.

77. The view that the Second Part of the poem of Parmenides is nothing but a summary of contemporary Pythagorean cosmology is, doubtless, incapable of rigorous demonstration, but it can be made extremely probable. The entire history of Pythagoreanism up to the end of the fifth century B.C. is, as has already been pointed out, conjectural; but, if we find in Parmenides ideas which are wholly unconnected with his own view of the world, and if we find precisely the same ideas in later Pythagoreanism, the most natural inference will surely be that the later Pythagoreans derived these views from their predecessors, and that they formed part of the original stock-in-trade of the society to which they belonged. This will only be confirmed if we find that these ideas are simply developments of those parts of the old Ionian cosmology which had been rejected by Xenophanes. We have seen (§ 48) how the latter dropped all those parts of Anaximander's system that seemed to lead to dualism, and we shall not be surprised to find that these were just what Pythagoras fixed upon and worked into his own system. Pythagoras came from Samos, which

always stood in the closest relations with Miletos; and it was not, so far as we can see, in his cosmological views that he chiefly displayed his originality. It has been pointed out above (§ 42) that the idea of the world breathing came from Anaximenes, and we need not be surprised to find traces of Anaximander as well.

As has been said already, the fundamental dualism of the Way of Opinion certainly creates a presumption in favour of the view that the system described in it is early Pythagoreanism. So far as we know, there were no other contemporary dualists to whom Parmenides could have referred. The question that now arises is simply whether it is possible to show that the particular form of dualism with which we have to do here can or can not be identified with that which we are justified on other grounds in ascribing to the Pythagoreans of the first half of the fifth century B.C.

Now, if we were confined to what Aristotle tells us on this subject, it would be almost impossible to make out a case; but his statements require, as usual, to be examined with a certain amount of care. He tells us, first of all, that the two elements of Parmenides were the Warm and the Cold.[25] In this he is so far justified by the fragments that, since the Fire of which Parmenides speaks is, of course, warm, the other element, which has all the opposite qualities, must of necessity be cold. But, nevertheless, the habitual use of the terms "*the* warm" and "*the* cold" is an accommodation to Aristotle's own system. In Parmenides himself they were simply one pair of attributes amongst others which distinguished the two "forms."

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[25] Τὸ θερμὸν καὶ τὸ ψυχρόν. *Met.* A, 3. 984*b*, 3; 5. 986*b*, 31; *Phys.* A, 5. 188*a*, 20; *Gen. Corr.* A, 3. 318*b*, 6; B, 3. 330*b*, 14.

Still more misleading is Aristotle's identification of these with Fire and Earth.[26] It is not quite certain that he meant to say Parmenides himself made this identification;[27] but, on the whole, it is most likely that he did, and Theophastros certainly followed him in this.[28] It is another question whether it is accurate. We know that the earth was made of the dense element;[29] and the suggestion of Zeller,[30] that this was the sole basis of the theory, is in every way probable. Simplicius, who had the poem before him (§ 71), after mentioning Fire and Earth, at once adds "or rather Light and Darkness;"[31] and this is suggestive enough. Lastly, Aristotle's identification of the dense element with "what is not,"[32] the unreal of the First Part of the poem, is not very easy to reconcile with the view that it is earth, though it seems to be sufficiently justified by v. 114. On the other hand, if we suppose that the second of the two "forms" which "should have been left out" is the Pythagorean Air or Void, we get a very good explanation of Aristotle's identification of it with "what is not." We seem, then, on the whole, to be justified in simply neglecting the identification of the dense element with earth altogether.[33] The further statement of Theophrastos, that the Warm was the efficient cause and the Cold the material or passive,[34] is intelligible enough if we identify them with the Limit and the Unlimited respectively; but is not, of course, to be regarded as strictly historical.

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[26] *Phys.* A, 5. 188*a*, 20; *Met.* A, 5. 986*b*, 31 (R. P. 99*a*).

[27] Brandis (*Comm. Eleat.* 167) and Karsten (*Reliquiæ*, i. 222) held that Aristotle merely gave this as his own inference; but Zeller rightly points out that we must not press the words οἷον πῦρ καὶ γῆν λέγων.

[28] *Phys. Op.* fr. 6 (*Dox.* p. 482; R. P. 99*a*). So also all the doxographers down to Cicero, *Acad.* ii. 118 (after Kleitomachos). R. P. *ib.*

[29] Plut. *Strom.* fr. 5 (*Dox.* p. 581): λέγει δὲ τὴν γῆν τοῦ πυκνοῦ καταρρυέντος ἀέρος γεγονέναι.

[30] Zeller, p. 520, *n.* 1 (Eng. trans. p. 593, *n.* 2).

[31] *Phys.* 25, 16 D.

[32] *Met.* A, 5. 986*b*, 35 (R. P. 99*a*).

[33] This disposes of the difficulty which Tannery finds here (*Science hellène*, p. 226 sq.). The subtle element does not, we shall see, correspond to the Unlimited, but to the Limit.

We have seen that Simplicius, with the poem of Parmenides before him, corrects Aristotle by substituting Light and Darkness for Fire and Earth,[35] and in this he is amply borne out by the fragments which he quotes. Parmenides himself calls one "form" Light, Flame, and and Fire (v. 116, 122), and the other Night (v. 119). We have now to consider whether these can be identified with the Pythagorean Limit and Unlimited. We have seen good reason to believe (§ 42) that the idea of the world breathing really belonged to the earliest form of Pythagoreanism,[36] and there can be no difficulty in identifying this "boundless breath" with Darkness, which stands very well for the Unlimited. "Air" or mist was always regarded as the dark element.[37] And that which gives definiteness to the vague darkness is certainly light or fire, and this may account for the prominence given to that element by Hippasos.[38] We may probably conclude, then, that the Pythagorean distinction between the Limit and the Unlimited, which we shall have to consider later (Chap. VII.), made its first appearance in the naively realistic form which Parmenides describes. The darkness or "air" of which he speaks is simply another name for the unreal, of which he had spoken in the First Part of his poem, and which should have been left out altogether (v. 113).

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[34] Theophr. *Phys. Op.* fr. 6 (*Dox.* p. 482; R. P. 99*a*), followed by the doxographers.

[35] See *n.* 31.

[36] For the Aristotelian references to this, see R. P. 63 B, *d.*

[37] Note the identification of the dense element with "air" in Plut. *Strom.*, quoted *n.* 29; and see Schmidt, *Griechische Synonymik*, § 35: "The idea of air, as we understand it, was unknown in early antiquity; yet wind and breath suggested a mysterious something that filled the space above the land and the water, as far as the clouds and beyond them. It was believed that this element was apprehended visibly in the clouds, and accordingly, in Homer, the word ἀήρ signifies the mist which is extended generally over all the earth, showing itself as the bluish veil which obscures objects when we look out over wide stretches of country." Cf. Chap. I. § 26 and Chap. V. § 85. Darkness was first proclaimed to be a mere shadow and not a real thing by Empedokles (Chap. III. § 61).

The heavenly bodies.

78. We must now look at the general cosmical view which was expounded in the Second Part of the poem. The fragments are scanty, and the doxographical tradition hard to interpret; but enough remains to show that here, too, we are on Pythagorean ground. All discussion of the subject must start from the following important passage of Aetios:—

> Parmenides held that there were crowns close together and encircling one another, formed of the rare and the dense element respectively, and that between these there were other mixed crowns made up of light and darkness. That which surrounds them all was solid like a wall, and under it is a fiery crown. That which is the midmost of all the crowns is also solid, and surrounded in turn by a fiery circle. The central circle of the mixed crowns is the cause of movement and becoming to all the rest. He calls it "the goddess who directs their course," "the Key-bearer," and "Necessity." (Aet. ii. 7. 1; R. P. 101 D.)

The first thing to be noted here is that the "crowns" of which Parmenides spoke are certainly not spheres, as is often supposed. The language used does not even suggest that the outermost of all, which is "solid like a wall," is so. The picture presented to us is rather that of a number of concentric rings like those of Anaximander (§ 18); and we shall see when we come to the details that this view is strikingly borne out by the fragments. The great difference is that, according to Aetios, the rings described by Parmenides were closely fitted together without any interval between them. They were, in fact, just like a nest of cylindrical boxes. Now this last comparison is actually used by Plato in the description of the Kosmos which he has inserted in his famous Myth of Er the Armenian,[39] and that description is clearly Pythagorean in substance.

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[38] Arist. *Met.* A, 3. 984*a*, 7 (R. P. 47*c*).

Coming to details it is clear, in the first place, that the solid ring on the outside is the "outermost Olympos" (v. 141), a distinctively Pythagorean idea. Immediately within it is a fiery circle, the Pythagorean Ouranos (v. 137), called also the æther by Parmenides (v. 141). If we can trust Aetios so far, the planet Venus, which Parmenides identified as the morning and evening star,[40] the sun, and the fixed stars were in this region.[41] It must, however, be allowed that the point seems rather doubtful. The solid region in the middle is, of course, the earth. I see no reason for supposing that this was regarded as spherical.[42] If it was, we should only, so far as I can see, have one ring formed of the dense element, namely, the outermost Olympos, which is contrary to what we are told by Aetios in the passage quoted above. We shall see presently that there is another reason for regarding the earth as annular. The fiery circle which surrounds the earth is simply the luminous atmosphere, which must be carefully distinguished from the dark "air" or mist.

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[39] *Rep.* x. 616 D. Plato calls the rings σφονδύλοι, not κύκλοι (Anaximander) or στεφαναί (Parmenides); but, in any case, they are not the spheres which played so important a part in later Greek astronomy.

[40] So Aet. ii. 15. 7 (confirmed as a doxographical tradition by D. L. viii. 14). The identification of the morning and evening star was also ascribed to Pythagoras (D. L. *loc. cit.*); and this so far confirms our view. Achilles (*Dox.* 19, *n.* 2) gave the priority in this discovery to the poet Ibykos of Rhegion, who was at Samos in the days of Pythagoras, and may have learnt it from him.

[41] Aet. ii. 15. 7.

[42] D. L. ix. 21 certainly says so; but that passage has been filtered through a biographical compendium (*Dox.* 166). From viii. 48 we gather that the word used by Theophrastos was not σφαιροειδής but στρογγύλη, which would apply to a ring just as well as to a sphere. Note that the priority in this matter also is claimed for Pythagoras (*Phys. Op.* fr. 17; *Dox.* p. 492).

Aetios tells us that between these encircling rings of the rare and the dense element there were mixed crowns composed of both. Here we have, fortunately, an important fragment (v. 126 sqq.) to help us. From this it appears that these crowns are really made up of a narrower crown of fire, surrounded by one of night, within which rushes the flame. This is simply the theory of Anaximander (§ 18), and nothing can be more likely than that Pythagoras adopted it from him. We note, however, that in the Myth of Er the planets are no longer rings of fire hidden, except at a single point, by dense rings of air, but apparently globes of fire situated at a single definite point on the rings.[43] This points, doubtless, to a development within the Pythagorean society.

In the same fragment which we have just been discussing, we are told (v. 128) that "in the midst of these" is "the goddess who directs the course of all things." Aetios, or his source, very naturally took this to mean "in the middle of the mixed crowns," which have just been described. But the words of Parmenides himself might just as well mean "in the midst of all the crowns"; that is to say, in the centre of the Kosmos, inside the circle of the annular earth. What is more, Simplicius, who had the complete poem before him, certainly understood that this goddess was in the centre.[44] Now, here again we have a distinctively Pythagorean idea, that of the Hestia or central fire (§ 125). Apparently Parmenides went on to describe how other gods, beginning with Eros (v. 133), were produced from this.[45]

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[43] *Rep.* x. *loc. cit.*

Aetios makes some other mistakes about this goddess which it is worth while to notice in passing. He says she was called "the Key-bearer"[46] and "Justice," which is clearly due to a confusion with the goddess who opens the gate to Parmenides in the allegorical introduction to his poem (v. 14). But, if we were not in a position to explain this mistake, what floods of mystical interpretation it would have let loose! It would be the easiest thing in the world to find a key-bearing goddess in Egypt,—Thmei, with her well-known symbol, would serve the turn admirably,—and Parmenides would be shown up as a mere plagiarist from the Book of the Dead. On the other hand, when Aetios says that the goddess was also called Necessity, he is probably right; for this agrees admirably with the Myth of Er.[47]

In the present state of the subject it would be unsafe to venture further than this in the discussion of astronomical details;[48] I can only hope that the account given will seem intelligible so far, and that the Pythagorean character of the system expounded has been made clear.

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[44] *Phys.* 34, 14 D (R. P. 101*b*). This view is adopted by Krische, Zeller, and Diels; but how they can accept it without regarding the earth as annular I do not understand. Cicero (*N. D.* i. 11. 28; R. P. 101*g*) makes the opposite mistake of regarding the goddess herself as a στεφανή.

[45] Philodemos (*De Piet.* 68, Gomperz; *Dox.* p. 534) tells us that Parmenides made his first god inanimate (a commonplace of Epicurean criticism), and identified the gods begotten of it with the passions of men. Cicero (*N. D.* i. 11. 28; R. P. 101*g*) mentions in particular War, Discord, and Desire.

[46] The MSS. of Stobaios have κληρεῦχον, which would be still mor absurd; but we must clearly read κληδοῦχον with Füllcborn.

[47] Plato, *Rep.* x. *loc. cit.*

Physiological theories.

79. If we remember that Kroton, in the fifth century B.C., was the seat of a famous medical school,[49] we shall not be inclined to doubt that the Pythagoreans paid some attention to the human body. As a matter of fact, the name of the Krotoniate Alkmaion has been handed down as representing this tendency within the society,[50] and we are accordingly prepared to find that Parmenides, in describing the views of his contemporaries, was obliged to say something on physiological as well as cosmological matters.

Man, according to the view which he expounds, first arose from the primitive slime.[51] This was Anaximander's view (§ 20), and may well have been adopted by the Pythagoreans. Further, he was composed, like everything else, of the warm and the cold element. In dealing with the problem of generation, Parmenides attacked the question of what determines the sex of the offspring males came from the right, and females from the left side (v. 150).[52] Women had more of the warm element, and men more of the cold,[53] a view diametrically opposed to that of Empedokles (§ 94).

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[48] The following points may be noted among those which require further examination. The sun and moon, which were of fire (Aet. ii. 20. 8, 25. 3), were said to be equal in size, and the moon derived its light from the sun (*ib*. 26. 2). This was because some of the dark element was mingled with its fiery substance, whence, too, it was called ψευδοφανής (*ib*. 30. 4). Both sun and moon were separated off from the Milky Way (*ib*. 20. 8*a*), which derives its peculiar colour from the mixture of the dense and the rare in it.

[49] Herod. iii. 131. The physician Demokedes married the daughter of the Pythagorean Milo (*ib*. 137).

[50] D. L. viii. 83 (R. P. 55*c*). It is true, as Krische observes (*Forsch*. p. 69), that Aristotle (*Met*. A, 5. 986*a*, 27 sqq.) does not say that Alkmaion was a Pythagorean; he rather implies that he was not. But this merely means that Aristotle did not find in his teaching any trace of the later Pythagoreanism which he knew.

[51] D. L. ix. 22 (R. P. 102 A), adopting the reading of the Basel edition, ἰλύος for ἡλίους.

Parmenides is classed by Theophrastos[54] with those who explained perception by similars. It is the preponderance of the warm or the cold element in a man that determines the character of his thought (v. 146 sqq.).[55] Death is caused by the removal of the fiery element, but even corpses retain a perception of what is cold and dark.[56]

In all this we see the first beginnings of an interest in biological matters which continued to grow steadily in the hands of Empedokles and others throughout the whole of this period, and we cannot be far wrong in ascribing this to the influence of the Pythagorising Asklepiads of Kroton. We must now turn to the consideration of the effect which the dialectic of Parmenides' First Part had upon the subsequent course of philosophy.

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[52] Some verses from the discussion of this subject have been preserved in a Latin translation by Cælius Aurelianus (fifth century A.D.), *De morb. chron.* iv. 9 (R. P. 102*a*). Cf. Aet. v. 7. 4, along with the remarks of Diels (*Dox.* p. 194).

[53] Arist. *Part. An.* B, 2. 648*a*, 28; *Gen. An.* Δ, 1. 765*b*, 19. With this is connected the statement that women first arose in the south, and men in the north (Aet. v. 7. 2).

[54] *De Sens.* 1.

[55] The words τὸ γὰρ πλέον ἐστὶ νόημα (v. 149) are correctly paraphrased by Theophr. *de Sens.* 3 : κατὰ τὸ ὑπερβάλλον ἐστὶν ἡ γνῶσις (R. P. 102 C); cf. Alex. in *Met.* p. 263, Bonitz : ὡς ἀεὶ κατὰ τὸ πλεονάζον καὶ ἐπικρατοῦν ἐν τῇ σωματικῇ διαθέσει αὐτοῦ (sc. τοῦ φρονεῖν) γινομένου. It is unnecessary to do more than allude to the extraordinary mistake Hegel makes about this (*Gesch. d. Phil.* i. 277).

[56] Theophr. *De Sens.* 4 (R. P. 102 C).

CHAPTER V.

EMPEDOKLES OF AKRAGAS.

80. THE belief that all things must be fundamentally one thing, was common to all the philosophers we have hitherto studied. The earliest had held that the different substances which we perceive in the world were all mere passing forms of some one underlying substance, be it Water, or Air, or Fire, or something which is none of these. But now Parmenides has shown that, if we are serious in holding that this one substance really *is*, we must make up our minds to abandon the idea that it can take different forms. The senses, which present to us a world of change and multiplicity, are deceitful. From this conclusion there was no escape; the time was still to come when philosophers would seek the unity of the world in something which, from its very nature, the senses could never perceive. It is true, no doubt, that the One of Parmenides is not, as a matter of fact, so perceived; but that is altogether the fault of the senses. We have not yet got to the stage where it is possible to regard the same world as one for thought though many for sense. The One, it still seemed, could not co-exist with the Many. **Pluralism.**

We find, accordingly, that from the time of Parmenides to that of Plato, all thinkers in whose hands philosophy made any real progress abandoned the monistic hypothesis. Those who still held by it for the most part adopted a purely critical attitude, and confined themselves to a dialectical defence of the theory of Parmenides against the new views. Some taught the doctrine of Herakleitos in an exaggerated form; some continued to expound the systems of the early Milesians. This, of course, showed a want of true insight into the problem; but even those philosophers who saw that Parmenides could not be left unanswered, were by no means equal to their predecessors in power and thoroughness. Philosophy does well, no doubt, to reject a "cheap and easy Monism," which simply sets the problem of multiplicity aside; but it cannot with impunity lose sight of what must always be its ultimate end, the interpretation of the world as a single whole. The corporealist hypothesis had proved itself unable to bear the weight of a monistic structure, and no other was available till the discussions of the "Sophists" and Sokrates suggested to Plato that a thing might be real without being a body. Meanwhile, a thoroughgoing pluralism, that is to say, an atomic theory, might have some value, if not as a final explanation of the world, yet at least as an intelligible view of a part of it. Any pluralism, on the other hand, which stops short of the atoms, like that of Empedokles and Anaxagoras, will achieve no permanent result, however many may be the brilliant *aperçus* which it embodies. It will still remain an attempt to reconcile two things which cannot be reconciled, and may always, therefore, be developed into contradictions and paradoxes.

Life of Empedokles. 81. Empedokles was a citizen of Akragas in Sicily. His father's name, according to the best accounts, was Meton.[1] His grandfather, also called Empedokles, had won a victory in the horse-race at Olympia in Ol. LXXI. (496 B.C.).[2] This proves that the family was both illustrious and public-spirited. To breed horses for the great games was always looked upon as an act of public munificence, not as a sign of private ostentation and vanity.

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[1] The name is amply attested by Aetios (*i.e.* Theophrastos), i. 3. 20 (R. P. 131 A), by Timaios, and by Apollodoros. Satyros, however, called

Apollodoros fixed the *floruit* of Empedokles in Ol. LXXXIV. (444 B.C.). This is the date of the foundation of Thourioi; and it appears from the quotation in Diogenes that it was selected simply on account of the statement made by the almost contemporary biographer, Glaukos of Rhegion, that Empedokles visited the new city shortly after its foundation. The date thus arrived at, taken in connexion with the statements of Aristotle and Herakleides that Empedokles died at the age of sixty, would yield the result that he was born in 484 and died in 424 B.C.[3] But we are in no way bound to believe that Empedokles was just forty years old at the time of that event in his life which can most easily be dated. This is the assumption made by Apollodoros; but there are, as Zeller has pointed out, and Diels now admits, a number of reasons for thinking that the date he thus arrives at is

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him Exainetos. There was an Olympic victor of that name in Ol. XCII., who was also a citizen of Akragas (Diod. xiii. 82), and this may have given rise to the mistake. A letter, professing to be from the pen of Telauges, son of Pythagoras, and addressed to Philolaos, called Empedokles the son of Archinomos (D. L. viii. 53); but this letter, as Neanthes of Kyzikos observed, deserves no credit (R. P. 129*d*). It appears to have formed part of a forged correspondence intended to connect Empedokles with the Pythagoreans (cf. R. P. 48 A, *b*, and *n*. 12, below).

[2] For this we have the authority of Apollodoros (D. L. viii. 52; R. P. 129), who follows the *Olympic Victors* of Eratosthenes, who in turn appealed to Aristotle. Herakleides of Pontos, in his Περὶ νόσων (*n*. 14), spoke of the elder Empedokles as a "breeder of horses" (R. P. 129*a*); and Timaios mentioned him as a distinguished man in his Fifteenth Book. Later writers, of course, made Empedokles himself the Olympic victor.

[3] R. P. 129.

too late by some eight or ten years.[4] It is, indeed, most likely that Empedokles did not go to Thourioi till after his banishment from Akragas, and he was probably more than forty years old when that happened. All, therefore, that we can be said to know of his date is, that his grandfather was still vigorous in 496 B.C.; that he himself was active at Akragas after 472, the date of Theron's death; and that he died later than 444 B.C.

Even these indications are enough to show that his boyhood must have coincided with the reign of Theron, the tyrant who co-operated with Gelon of Syracuse in the repulse of the Carthaginians from Himera, and under whom Akragas attained to such a height of splendour and prosperity. Theron's son and successor, Thrasydaios, was, however, a man of a very different character. Before his accession to the throne of Akragas, he had ruled in his father's name at Himera, and had completely estranged the affections of the inhabitants. Theron died in 472 B.C., Thrasydaios came to rule in his stead, and at once displayed all the vices and follies usual in the second holder of a usurped dominion. After a disastrous war with Hieron of Syracuse, he was driven out; and Akragas enjoyed a free government till it fell before the Carthaginians more than half a century later.[5]

In the political events of the next few years, Empedokles certainly played an important part; but our information as to those events is of a very unsatisfactory kind. Diogenes has extracted from the Sicilian historian Timaios one or two stories illustrating the political action of Empedokles. These stories are obviously genuine popular traditions picked up by Timaios himself about a hundred and fifty years afterwards; but, like all popular traditions, they are somewhat confused. The picturesque incidents are remembered, but the essential parts of the story, which alone could make it intelligible, are dropped altogether. Still, we may be thankful that the "collector of old wives' tales,"[6] as sneering critics called him, has not attempted to rationalise the traditions, but has enabled us to measure the historical importance of Empedokles for ourselves by giving us a glimpse of the way in which he was pictured by the great-grandchildren of his contemporaries.

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[4] Diels, *Empedokles und Gorgias*, *n.* 2 (*Sitzungsber. d. K. Preuss Akad.* 1884). Theophrastos said that Empedokles was born "not long after Anaxagoras" (*Dox.* p. 477, 17*n*); and Alkidamas made him the fellow-pupil of Zeno under Parmenides, and the teacher of Gorgias (see below, *n.* 18). Now Gorgias was a little older than Antiphon (*b.* Ol. LXX.), so it is clear we must go back *at least* to 490 B.C. for the birth of Empedokes.

[5] On all this see Professor Freeman's *History of Sicily.*

We read, then,[7] that once he was invited to sup with one of the "rulers." Tradition delights in such vague titles. "The supper was well advanced, but no drink was brought in. The rest of the company said nothing, but Empedokles was righteously indignant, and insisted on wine being produced. The host, however, said he was waiting for the serjeant of the Council. When that official arrived, he was appointed ruler of the feast. The host, of course, appointed him. Thereupon he began to give hints of an incipient tyranny. He ordered the company either to drink or have the wine poured over their heads. At the time, Empedokles said nothing, but next day he led both of them before the court, and had them condemned and put to death—both the man who asked him to supper and the ruler of the feast." Surely a sharp punishment for so slight a display of *incivisme!*

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[6] He is called *γραοσυλλεκτρία* in Souidas, *s.v.* The view taken in the text as to the value of his evidence is that of Holm.

[7] Timaios, fr. 88*a* (ap. D. L. viii. 63), F. H. G. i. p. 214.

And yet the story, unintelligible as it is, has its value as showing that Empedokles was remembered long after as an uncompromising champion of democratic equality. The next tale is like it. It is to the effect that Empedokles prevented the Council from granting his friend Akron a piece of land for a family sepulchre, on the ground of his eminence in medicine, and supported his objection by a punning epigram.[8] Lastly, we are told he broke up the assembly of the Thousand—doubtless some oligarchical association or club.[9] It was perhaps in consequence of this that he was offered the kingship, which Aristotle tells us he refused.[10] At any rate, it is quite evident that Empedokles was the great democratic leader at Akragas in those days, though we have no clear knowledge of what he did.

But there is another side to the public character of Empedokles which Timaios found it hard to reconcile with his political views. He claimed to be a god, and to receive the homage of his fellow-citizens in that capacity. Of this the fragments from the *Purifications* furnish ample evidence. The fact is that Empedokles was not a mere statesman; he had also a good deal of the "medicine-man" about him. According to Satyros, who most likely followed Alkidamas,[11] Gorgias actually affirmed that he had been present when his master was performing his magical tricks. We have seen in Chap. II. what this sort of thing means, and we need not here repeat what was said there on the causes and character of the religious movements so common in this period of Greek history.

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[8] D. L. viii. 65. The epigram runs thus—

ἄκρον ἰητρὸν Ἄκρων᾽ Ἀκραγαντῖνον πατρὸς ἄκρου
κρύπτει κρημνὸς ἄκρος πατρίδος ἀκροτάτης.

[9] Timaios, fr. 88 (ap. D. L. viii. 66), F. H. G. i. p. 213. The text runs: ὕστερον δὲ ὁ Ἐμπ. καὶ τὸ τῶν χιλίων ἄθροισμα κατέλυσε, συνεστὼς ἐπὶ ἔτη τρία. The word ἄθροισμα hardly suggests a legal council, and συνεστάναι is most naturally used of a conspiracy. For ἐπὶ ἔτη τρία I would suggest ἐπὶ πονηρίᾳ, or some such phrase.

[10] D. L. viii. 63. Probably Aristotle mentioned this in his *Sophist*; cf. *n*. 16.

[11] D. L. viii. 59 (R. P. 129). Diels suggests (*Emp. u. Gorg*. p. 358)

But there is one point in connexion with the religious activity of Empedokles that must not be passed over in silence. Otto Kern has shown very strong reasons indeed for believing that he knew and constantly imitated the so-called *Rhapsodic Theogony*, ascribed to Orpheus and partially preserved by Damaskios.[12] If this be so, we cannot be far wrong in believing also that he was an adherent of the great Orphic sect which was so powerful in Hellas at this time. Everything seems to point to this conclusion, and the subject is most important for the historian of Greek religion. Here it only comes in incidentally. We must remember that Empedokles was an Orphic preacher if we wish to form a just idea of the character of the man; yet it is not as a religious teacher that we have to consider him at present, but as a representative of the scientific tradition which starts from Thales. We should only confuse matters by bringing the Orphic theology into a history of philosophy; for its influence upon the development of science was purely external.

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that the *φυσικός* of Alkidamas was a dialogue, in which Gorgias was the chief speaker.

[12] See *Introd. n.* 5, and O. Kern, *Empedokles und die Orphiker* (*Arch.* i. p. 498 sqq.). The view that Empedokles was not an Orphic, but a Pythagorean, is, however, as old as Timaios, who said (D. L. viii. 54; R. P. 129) that he was expelled from the Order for "appropriating discourses." Neanthes of Kyzikos added that the Pythagoreans in consequence made a rule never to impart their secrets to a maker of verses (R. P. 129*d*). All this falls to the ground with the theory of an esoteric Pythagorean doctrine (Chap. II. § 36). The forged letters which made Empedokles a disciple of Hippasos and Brontinos were rejected even by Neanthes.

Diogenes relates a number of marvels performed by Empedokles. For the most part, these are nothing but inferences from his own writings, on much the same level as the anecdotes of Herakleitos discussed above (§ 50, *n.* 5). Timaios related how Empedokles had weakened the force of the etesian winds by hanging bags of asses' skins on the trees to catch them. He had certainly said, in his exaggerated way, that the knowledge of science as taught by him would enable his disciple to control the winds (v. 26); and this, along with the fabled windbags of Aiolos, is sufficient to account for the tale.[13] We are also told how Empedokles brought back to life a woman who had been breathless for thirty days. The verse where he asserts that his teaching will enable Pausanias to bring the dead back from Hades (v. 32) shows how this statement may have arisen.[14] Again, we hear that he sweetened the pestilent marsh between Selinous and the sea by diverting the rivers Hypsas and Selinos into it. We know from coins that this purification of the marshes actually took place, but we may doubt whether it was attributed to Empedokles till a later time.[15]

We see, then, that the anecdotes which have come down to us with regard to the political action and the miraculous achievements of Empedokles have no very solid basis. But they undoubtedly point to something real; and Aristotle was able to ascribe to Empedokles the beginnings of Rhetoric,[16] while Galen makes him the founder of the Italian school of Medicine.[17]

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[13] I follow the wilder form of the story given by D. L. viii. 60, and not the rationalised version of Plutarch (*Adv. Col.* 1126). The epithets ἀλεξανέμας and κωλυσανέμας were perhaps bestowed by some sillographer in mockery; cf. ἀνεμοκοίτης.

[14] The Περὶ νόσων of Herakleides, from which it is derived, seems to have been a sort of philosophical romance. The words are (D. L. viii. 60): Ἡρακλείδης δὲ ἐν τῷ Περὶ νόσων φησὶ καὶ Παυσανίᾳ ὑφηγήσασθαι αὐτὸν τὰ περὶ τὴν ἄπνουν.

[15] For these coins see Head, *Historia Numorum*, p. 147 sqq. Karsten thought that Empedokles was actually represented on them, but the view of Eckhel (*Doctr. Numm.* i. 239) is now accepted by the best authorities.

It will be observed that in the traditional account of the life of Empedokles we hear surprisingly little of his theory of nature. The only hints we get of it are in certain statements as to his teachers. Alkidamas, who had good opportunities of knowing, made him a fellow-student with Zeno under Parmenides. This is both possible and likely.[18] Theophrastos also made him a follower and imitator of Parmenides.[19] But the further statement of Alkidamas, that Empedokles "heard" Pythagoras, must rest upon some confusion,[20] and it is not at all likely that he knew anything of Anaxagoras.[21]

Tradition told many marvels as to the death of Empedokles. He was supposed, as every one knows, to have leapt into the crater of Etna that he might be deemed a god. This appears to be a malicious invention[22] designed to counteract the effect of another tale set on foot by his adherents to the effect that he had been snatched up to heaven in the night.[23] Both stories would easily get accepted; for there was no local tradition at all as to the death of Empedokles. He did not die in Sicily, but in the Peloponnese, or, perhaps, at Thourioi. He had gone, it seems, to Olympia, the scene of his grandfather's triumph, in order to have his religious poem recited to the Hellenes; his political enemies were able to prevent his return, and he was seen in Sicily no more.[24]

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[16] Aristotle's *Sophist*, ap. Sext. *Math.* vii. 6, and D. L. viii. 57 (R. P. 129*g*); cf. Quint. *Inst. Or.* iii. 1. 8. Diels has shown (*Emp. u. Gorg.*) that many of the rhetorical artifices of Gorgias are already to be found in the poem of Empedokles. Our oldest authority for the statement that Gorgias was a pupil of Empedokles is Satyros (R. P. 129); but he seems to have derived his information from Alkidamas, the pupil of Gorgias himself.

[17] *Therap.* 1; Pliny (*H. N.* xxix. 3) speaks of Akron as the founder of the Empirical sect, and says that its adherents were *Empedoclis physici auctoritate commendati.* The medical work in prose which went at Alexandria by the name of Empedokles (*n.* 28) was doubtless forged by the empiricists to give additional weight to this tradition.

[18] For the dates of Parmenides and Zeno, see Chap. IV. § 70, and Chap. VIII. § 129.

[19] Ap. D. L. viii. 53 (R. P. 129).

[20] Perhaps Alkidamas said "the Pythagoreans;" this is a very common source of error.

[21] It is true that Anaxagoras was a little older than Empedokles, but it is more likely that he borrowed from his younger contemporary than *vice versa.* See below, Chap. VI. § 103.

Writings. 82. Empedokles was the second philosopher to expound his system in verse, if, as is only right, we leave the satirist Xenophanes out of account. He was also the last among the Greeks; for the forged Pythagorean poems may be neglected. In antiquity, the poems of Parmenides and Lucretius are the only other instances of the same thing; and Lucretius imitates Empedokles, just as Empedokles imitated Parmenides. It is easy to see that poetry is quite unsuited for philosophical or scientific writing. It was not, as cannot be too often repeated, the form in which philosophy first appeared; for Anaximander, Anaximenes, and Herakleitos wrote in prose, or what was meant for prose. The adoption of poetry as a vehicle for their teaching by Parmenides and Empedokles was due to purely accidental causes. These were, first, the vogue of the quasi-philosophical satire of Sicily, represented by Xenophanes and Epicharmos; and, secondly, the use of the metrical form in the productions of the Orphic sect.

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[22] R. P. 129*h*. The story is always told with a hostile purpose. In one of the absurd epigrams in D. L. viii. 75, it is suggested that Emp. went up to study the crater and fell in by accident; and this view is actually adopted by Bayle.

[23] R. P. *ib.* This was the story told by Herakleides of Pontos.

[24] Timaios took the trouble to refute the common stories at some length (D. L. viii. 71 sq.; R. P. *ib.*). He was quite positive that Emp. never returned to Sicily. Nothing can be more likely than that, when wandering as an exile in the Peloponnese, he should have seized the opportunity of joining the colony at Thourioi, which was a harbour for many of the "sophists" of this time.

Of course, the poetical imagery creates a difficulty for the interpreter; but we should probably be wrong in rating this too highly. It cannot be said that it is much harder to extract the philosophical kernel from the verses of Empedokles than from the prose of Herakleitos. It is not easy to write prose now, and in the fifth century B.C. it was much harder. Even Anaxagoras wrote an intolerable style, and a fairly good philosophical prose is to be found first in Melissos and Diogenes of Apollonia.

There is considerable divergence of opinion as to the poetical merit of Empedokles. The panegyric of Lucretius is well known.[25] Aristotle says in one place that Empedokles and Homer have nothing in common but the metre; in another, that Empedokles was "most Homeric."[26] To my mind, there can be no question that he was a genuine poet, far more so than Parmenides. No one doubts nowadays that Lucretius was one, and Empedokles really resembles him very closely. Pessimism leads itself to imaginative treatment, and, besides, Empedokles was a man of extremely vivid perceptions.

The remains.

83. We have more abundant remains of the writings of Empedokles than of any other early Greek philosopher. If we may trust our manuscripts of Diogenes and of Souidas, the librarians of Alexandria estimated the *Poem*

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[25] Lucr. i. 716 sqq.

[26] *Poet.* 1. 1447*b*, 18; cf. fr. 59, 1485*b*, 8.

on Nature, and the *Purifications* together as 5000 verses, of which about 2000 belonged to the former work.[27] Stein succeeded in getting together 451 verses, of which he refers 351 to the cosmological work, and only 100 to the religious. Besides the two poems, the Alexandrian scholars possessed a prose work of 600 lines on medicine ascribed to Empedokles. This was no doubt spurious.[28] The tragedies and other poems which were sometimes ascribed to the philosopher seem really to belong to a younger writer of the same name, who is said by Souidas to have been his grandson.[29]

I give the remains of the two poems as they are arranged by Stein :—

BOOK I.

And do thou give ear, Pausanias, son of Anchitos the wise ![30]

. . . .

For straitened are the powers with which their bodily parts are endowed, and many are the woes that burst in on them and blunt the edge of their careful thoughts! They behold but a brief span of a life that is no life, and, doomed to swift death, are borne away and fly off like smoke. Each is convinced of

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[27] D. L. viii. 77 ; cf. Souidas, *s.v.*

[28] See above, *n.* 17, and Stein, *Empedocles*, p. 7.

[29] Hieronymos of Rhodes declared (D. L. viii. 48) that he had met with forty-three of these tragedies; but see Stein, *loc. cit.* The poem on the Persian Wars, which Hieronymos also refers to (D. L. viii. 57), seems to have arisen from an old corruption in the text of Arist. *Probl.* 929*b*, 16, where Bekker still reads ἐν τοῖς Περσικοῖς. The same passage, however, is said to occur ἐν τοῖς φυσικοῖς, in *Meteor.* Δ, 4. 382*a* 1, though there, too, E^b reads Περσικοῖς.

[30] The poem opens with an address to Pausanias of Gela, insisting (1) upon the hopelessness of complete knowledge and the necessity for investigation of detail (vv. 2-23), while at the same time (2) presenting a highly coloured picture of the results that this investigation will achieve (vv. 24-32).

that alone which he has chanced upon as he is hurried to and
fro, and idly fancies he has found the whole. So hardly can
these things be seen by the eyes or heard by the ears of men,
so hardly grasped by their mind! Thou,[31] then, since thou
hast found thy way hither, shalt learn no more than mortal 10
mind has seen.[32] R. P. 130.

. . . .

But, O ye gods, turn aside from my tongue the madness of
those men.[33] Hallow my lips and make a pure stream flow from
them! And thee, much-wooed, white-armed Virgin Muse, do
I beseech, that I may hear what is lawful for the children of a
day! Speed me on my way from the abode of Holiness and 15
drive my willing car! Constrain me not to win garlands of
honour and glory at the hands of mortals on condition of
speaking in my pride beyond that which is lawful and right, and
only so to gain a seat upon the heights of wisdom. R. P. *ib.*

Go to now, consider with all thy powers in what way each
thing is clear. Hold nothing that thou seest in greater credit 20
than what thou hearest, nor value thy resounding ear above the
clear instructions of thy tongue;[34] and do not withhold thy
confidence in any of thy other bodily parts by which there
is an opening for understanding,[35] but consider everything
in the way it is clear. R. P. *ib.*

. . . .

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[31] The person here addressed is still Pausanias, and the speaker Empedokles. The view of Bergk and others, that a goddess is the speaker, as with Parmenides, is refuted by the invocation at the beginning of Book III. (vv. 338–341), which has been recovered from Hippolytos since Bergk wrote. Besides, the participles, etc., are masculine throughout. See Stein, *Empedoclis Fragmenta*, p. 19 sqq.

[32] I adopt Panzerbieter's ὄπωπεν for ὄρωρεν.

[33] No doubt Xenophanes and Parmenides. I believe that v. 146 sqq. should be inserted here.

[34] The sense of taste, not speech. So already Karsten, after Schneider, *Lex. Gr.*

[35] I follow Stein in the punctuation of this passage (comma after νοῆσαι and ἄλλων closely with γυίων). Zeller puts a full stop after νοῆσαι, with Bergk and Karsten, thus getting exactly the opposite sense. But there is no contrast here between sensation and thought; the word νόει is used in its original wide sense. The paraphrase given by Sextus (R. P. 130) is substantially correct, if we allow for later phraseology.

And thou shalt learn all the drugs that are a defence against ills and old age, since for thee alone shall I accomplish all this. Thou shalt arrest the violence of the weariless winds that arise and sweep the earth, laying waste the corn-fields with their breath; and again, when thou so desirest, thou shalt bring their blasts back again with a rush. Thou shalt cause for men a seasonable drought after the dark rains, and again after the summer drought thou shalt produce the streams that feed the trees as they pour down from the sky. Thou shalt bring back from Hades the life of a dead man.[36]

. . . .

Hear first the four roots of all things:[37] shining Zeus, life-bringing Hera, Aidoneus, and Nestis dripping with tears, the well-spring of mortals.[38] R. P. 131 A.

. . . .

And I shall tell thee another thing. There is no coming into being of aught that perishes, nor any end for it in baneful death; but only mingling and separation of what has been mingled. Coming into being is but a name given to these by men. R. P. 131 B.

. . . .

But, when the elements have been mingled in the fashion of a man and come to the light of day, or in the fashion of the race of wild beasts or plants or birds, then men say that these come into being; and when they are separated, they call that, as is the custom, woful death. I too follow the custom, and call it so myself.[39]

. . . .

Fools!—for they have no far-reaching thoughts—who deem

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[36] Quoted by D. L. viii. 60 (after Satyros). The verses cannot come from the *Purifications*, as Sturz believed, for that poem is addressed, not to a single person, but to the citizens of Akragas. Nor can it come from the (spurious) medical work, as maintained by Karsten, for that was in prose (*n.* 17).

[37] The first half of Book I. (down to v. 129) gives the general theory of the eternal elements and their perishable combinations.

[38] On the interpretation of this verse see below, § 85, and Diels, *Dox.* p. 90, *n.* 3. The κρούνωμα βρότειον is the σπέρμα; cf. Aet. i. 3. 20.

[39] These lines are preserved in a very corrupt state by Plutarch (*Adv. Col.* 1113), but the meaning is quite clear. The οἱ refers to the four elements personified.

that what before was not comes into being, or that aught can
perish and be utterly destroyed. For it cannot be that aught
can arise from what in no way is, and it is impossible and
unheard of that what *is* should perish; for it will always *be*,[40] 50
wherever one may keep putting it. R. P. 131*d*.

A man who is wise in such matters would never surmise in
his heart that, so long as mortals live what men choose to call
their life, they are, and suffer good and ill; while, before they
were formed and after they have been dissolved they are, it
seems, nothing at all. R. P. *ib.*

But it is ever the way of low minds to disbelieve the better 55
sayings. Do thou learn as the sure testimonies of my Muse
bid thee, and divide the argument in thy heart.

. . . Joining one choice argument to another, not to finish
one path[41] . . . for what is right may well be said even twice.

I shall tell thee a twofold tale. At one time things grew to 60
be one only out of many; at another, that divided up to be
many instead of one. There is a double becoming of perishable
things and a double passing away. The coming together of all
things brings one generation into being and destroys it; the
other grows up[42] and is scattered as things become divided. 65
And these things never cease, continually changing places, at
one time all uniting in one through Love, at another each
borne in different directions by the repulsion of Strife. Thus,
as far as it is their nature to grow into one out of many, and
to become many once more when the one is parted asunder, so 70
far they come into being and their life abides not. But,
inasmuch as they never cease changing their places continually,
so far they are immovably[43] as they go round the circle of
existence. R. P. 132.

. . . .

But come, hearken to my words, for it is learning that
increaseth wisdom. As I said before, when I declared the 75

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[40] I read αἰεὶ γὰρ τῇ γ' ἔσται with Panzerbieter. The MSS. of M. X. G., where the verse is quoted, have θήσεσθαι.

[41] I adopt Knatz's μήτι τελεῖν for μήτι λέγειν of the MSS. (*Empedoclea*, p. 7, in *Schedæ Philol. Hermanno Usener oblatæ*, Bonn 1891.)

[42] We must certainly retain θρεφθεῖσα here with Stein.

[43] Adopting Panzerbieter's ἀκινητί.

heads of my discourse, I shall tell thee a twofold tale. At one time things grew together to be one only out of many, at another they parted asunder so as to be many instead of one;—Fire and Water and Earth and the mighty height of Air,[44] dread Strife, too, apart from these and balancing every one of them, and Love among them, their equal in length and breadth. Her do thou contemplate with thy mind, nor sit with dazed eyes. It is she that is deemed to be implanted in the frame of mortals. It is she that makes them have kindly thoughts and work the works of peace. They call her by the names of Joy and Aphrodite. Her has no mortal yet marked moving among the gods,[45] but do thou attend to the undeceitful ordering of my discourse. R. P. 132.

. . . .

For all these are equal and alike in age, yet each has a different prerogative and its own peculiar nature. And nothing comes into being besides these, nor do they pass away; for, if they had been passing away continually, they would not be now. R. P. 132.

. . . .

Nor is any part of the whole empty. Whence, then, could aught come to increase it?[46] Where, too, could these things perish, since no place is empty of them? They are what they are; but, running through one another, different things continually come into being from different sources, yet ever alike. R. P. 132.

. . . .

Come now, look at the things that bear witness to my earlier discourse, if so be that there was any form left out in the

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[44] We must retain the *αἰθέρος* of Clement and Plutarch here. The *ἀέρος* of Simplicius is a mere interpretation. See below, § 85.

[45] The MSS. of Simplicius have *μετ' ὄσσοισιν* and *μετ' ὄσοισιν*. I accept Fr. Knatz's convincing *μετὰ θεοῖσιν* (*op. cit.* p. 8). The "gods" are, of course, the elements.

[46] I have inserted Stein's v. 91 after v. 134 (see note, *in loc.*), and have substituted for it here—

τοῦ παντὸς δ' οὐδὲν κενεόν. πόθεν οὖν τί κ' ἐπέλθοι;

which Apelt has restored in M. X. G. 976*b*, 25, from the *Codex Lipsiensis*, neglected by Bekker, though already collated by Beck. Stein's v. 92 has been fabricated from M. X. G. 975*b*, 11, and does not seem to me to be Empedokles' at all.

earlier list.[47] Behold the sun, everywhere bright and warm,
and all the immortal things that are bathed in its heat and
bright radiance.[48] Behold the rain, everywhere dark and cold; 100
and from the earth issue forth things close-pressed and solid.
When they are in strife all these are different in form and
separated; but they come together in love, and are desired by
one another. R. P. 132.

For out of these have sprung all things that were and are
and shall be,—trees and men and women, beasts and birds and 105
the fishes that dwell in the waters, yea, and the gods that live
long lives and are exalted in honour. R. P. 132*i*.

For these things are what they are; but, running through
one another, they take different shapes—so much does mixture
change them.[49] R. P. 132*g*.

. . . .

For, of a truth, they (*i.e.* Love and Strife) were aforetime 110
and shall be; nor ever, methinks, will boundless time be
emptied of that pair. And they prevail in turn as the circle
comes round, and pass away before one another, and increase in
their appointed turn. R. P. 132*c*.

For these things are what they are; but, running through
one another, they become men and the other races of mortal 115
creatures. At one time they are brought together into one
order by Love; at another, again, they are carried each in
different directions by the repulsion of Strife, till once more
they grow into one and are wholly subdued.[50]

Just as when painters are elaborating temple-offerings, men 120
whom Metis has well taught their art,—they, when they have
taken pigments of many colours with their hands, mix them in
a harmony, more of some and less of others, and from them
produce shapes like unto all things, making trees and men and
women, beasts and birds and fishes that dwell in the waters, 125

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[47] I read λιπόξυλος ἔπλετο μορφή. The MSS. of Simplicius have μορφή, not μορφῇ, though they read λιπόξυλον. For the use of μορφή, cf. Parm. 113.

[48] Reading ἄμβροτα δ' ὅσσ' ἴδει with Diels. For the word ἴδος, cf. v. 266, *n.* 74. The reference is to the moon, etc., which are made of solidified Air, and receive their light from the fiery hemisphere. See below, § 91.

[49] For the reading here see Diels, *Hermes*, xv. 163.

[50] Reading with Diels (*Hermes*, xv. 163)—

εἰσόκ' ἐς ἓν συμφύντα τὸ πᾶν ὑπένερθε γίνηται.

yea, and gods, that live long lives, and are exalted in honour,—so let not the error prevail over thy mind,[51] that there is any other source of all the perishable creatures that appear in countless numbers. Know this for sure, for thou hast heard the tale from a goddess.[52]

130 Come, I shall now tell thee first of all[53] the beginning of the sun, and the sources from which have sprung all the things we now behold, the earth and the billowy sea, the damp mist and the Titan air that binds his circle fast round all things. R. P. 135*a*.

It was spherical . . . naught of the whole was empty and naught superfluous.[54]

135 In it is distinguished neither the bright form of the sun, no, nor the shaggy earth in its might, nor the sea,—so fast was the god bound in the close covering of Harmony, spherical and round, rejoicing in his circular rest.[55] R. P. 133 A.

But when Strife was grown great in the limbs of the god
140 and sprang forth to claim his prerogatives, in the fulness of the alternate time set for them by the mighty oath, . . . for all the limbs of the god in turn quaked. R. P. 133 A and B.

[Everything heavy and everything light it (Strife) separated apart. R. P. 133*e*.][56]

. . . Without affection and incapable of mixing.

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[51] Reading with Blass (*Jahrb. f. Phil. u. Päd.* 1883, p. 19)—

οὕτω μή σ' ἀπάτη φρένα καινύτω κ.τ.λ.

cf. Hesychios: καινύτω· νικάτω. This is practically what the MSS. of Simplicius give, and Hesychios has many Empedoklean glosses.

[52] The "goddess" is, of course, the Muse. Cf. v. 56.

[53] The section referred to by Arist. *Phys.* B, 4. 196*a*, 22, as the κοσμοποιία begins here.

[54] I have inserted Stein's v. 91 here because M. X. G. 976*b*, 27 shows it referred to the Sphere. Mr. Bywater suggests that σφαῖρον here and σφαῖρος (v. 138) are adjectives, not nouns.

[55] The text of v. 138 must be wrong. I cannot see how μονίη can mean "rest." We must read μονῇ with Buttmann, who inserts τι to fill up the line. This makes it necessary to take σφαῖρος as an adjective (see last note).

[56] This verse has been fabricated from the passage of Plutarch, quoted R. P. 133 B. Stein's line will not even scan. Diels has certainly made a hexameter of it, but it is better away altogether. It cannot be reconciled with Arist. *De Cœlo*, Δ, 2. 309*a*, 20, where we are told that Emp. gave no account of lightness and weight.

. . . The heaped up mass. . . . 145

If the depths of the earth and the vast air were infinite, a foolish saying which has been vainly dropped from the lips of many mortals, though they have seen but a little of the All. . . .[57] R. P. 86*b*.

The sharp-darting sun and the gentle moon. But (the sunlight) is gathered together and circles round the mighty heavens.[58] 150

It[59] flashes back to Olympos with untroubled countenance. R. P. 135*c*.

But the gentle flame (of the eye) has but a scanty portion of earth.[60]

Even so the sunbeam, having struck the broad and mighty circle of the moon, returns at once, running so as to reach the sky.[61]

It circles round the earth, a borrowed light, as on the track of a car. 155

For she gazes at the sacred circle of the lordly sun opposite.

And she scatters his rays away into the sky above,[62] and casts a shadow on as much of the earth as is the breadth of the pale-faced moon.

It is the earth that makes night by coming before the lights. 160

. . . of deserted, blind-eyed night.

And many fires burn beneath the earth.[63]

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[57] See above, *n.* 33. The lines are referred to Xenophanes in M. X. G. 976*a*, 35.

[58] Karsten (followed by Mullach) makes several strange mistakes about this verse. Surely ἀλισθεὶς comes from ἀλίζω, "to gather," not (!) from ἀλίνδω, "to roll."

[59] *Sc.* "the earth," of which the sun is a reflexion. See below, § 91.

[60] This verse is misplaced by Stein, who referred it to the moon. See R. P. p. 140, *n.* 1.

[61] Plutarch (*De fac. in orb. lun.* 929) has—

ὡς αὐγὴ τύψασα σεληναίης κύκλον εὐρύν

Diels (*Hermes*, xv.) has constructed the next line—

καὶ μέγαν, αὐτίκ' ἀνῆλθε θέουσ' ὡς οὐρανὸν ἵκῃ,

from the Armenian version of Philo.

[62] I read—

ἀπεσκίδασεν δέ οἱ αὐγὰς εἰς αἶθρην καθύπερθεν, κ.τ.λ.,

as suggested by Stein in his note.

[63] Reading ἴδιος with Diels (cf. Hesychios, ἴδος· ἔδαφος, γῆ), or οὔδιος (cf. πόλιος, v. 353).

The sea with its silly tribe of fertile fish.
Salt was solidified by the impact of the sun's beams.
165 Sea, the sweat of the earth. . . . R. P. 135*b*.

But the air sunk down upon the earth with its long roots;[64]
for thus it chanced to be running at that time, though often it
runs otherwise. R. P. 135*d*.

(Fire) swiftly rushing upwards. . . .

But now I shall retrace my steps over the paths of song that
170 I have travelled before, drawing from my saying a new saying.
When Strife was fallen to the lowest depth of the vortex,[65] and
Love had reached to the centre of the whirl, in it do all things
come together so as to be one only; not all at once, but coming
together gradually each from different quarters; and, as they
175 came together, Strife retired to the extreme boundary. Yet
many things remained unmixed, alternating with the things
that were being mixed, namely, all that Strife not fallen yet
retained; for it had not yet altogether retired perfectly to the
outermost boundaries of the circle. Some of its members still
180 remained within, and some had passed out. But in proportion
as it kept rushing out, a soft, immortal stream of blameless Love
kept running in, and straightway those things became mortal
which had been immortal before, those things were mixed that
had been unmixed, each changing its path. And, as they were
mingled, countless tribes of mortal creatures were scattered
185 abroad endowed with all manner of forms, a wonder to behold.
R. P. 134.

. . . .

For all of them—sun earth, sky, and sea,—fit in with all
the parts of themselves, the friendly parts which are separated
off in perishable things. In the same way, all those things that
190 are more adapted for mixture, are united to one another in
Love, made like by the power of Aphrodite. But they them-

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[64] The conjecture of Diels, ῥιπαῖς for ῥίζαις (*Hermes*, xv. p. 164), had been already suggested by Karsten, but no change is really required. We may have "roots" of air as well as of earth. Cf. Chap. II. *n*. 79. The reference, no doubt, is to the period of Love; and Empedokles is thinking of the marriage of Zeus and Hera, as suggested by Knatz (*op. cit.* p. 6), who compares Aisch. fr. 41, and Eur. fr. 836, Dind.

[65] The "lowest depth" is not, as might be supposed, the centre; but is the same thing as the "extreme boundary" (v. 178).

selves (*i.e.* the elements) differ as far as possible in their origin and mixture and the forms imprinted on each, being altogether unaccustomed to come together, and very hostile, under the influence of Strife, since it has wrought their birth.[66]

Thus all things have thought by the will of fortune. . . . 195
And, inasmuch as the rarest things came together in their fall. . . .

Fire is increased by Fire, Earth increases its own mass, and Air swells the bulk of Air.

And the kindly earth[67] in its well-wrought[68] ovens received
two parts of shining Nestis out of the eight, and four of 200
Hephaistos; and they became white bones, divinely fitted together by the cements of Harmony. R. P. 138*c*.

And the earth meets with these in nearly equal proportions,
with Hephaistos and Water and shining Air, anchoring in the 205
perfect havens of Kypris,—either a little more of it, or less of it and more of them. From these did blood arise and the various forms of flesh. R. P. 138*c*.

(As a baker) cementing barley-meal with water. . . .[69]

. . . tenacious Love. . . .

BOOK II.

But if your assurance of these things was in any way 210
deficient as to how, out of Water and Earth and Air and Fire mingled together, arose the colours and forms of all those mortal things that have been fitted together by Aphrodite, and so are

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[66] For the text here followed (νείκεος ἐννεσίῃσιν, ἐπεί σφισι γένναν ἔοργεν), see Diels, *Hermes*, xv. p. 165.

[67] The following lines describe the formation of perishable combinations of the four elements. We are told in Simpl. *Phys*. 300, 20 D, that they belonged to the First Book.

[68] I read εὐτύκτοις with Simpl. *Phys*. p. 300 D.

[69] These words are twice quoted by Aristotle (*Meteor*. 382*a*, 1; *Probl*. 929*b*, 16). The masculine gender shows that the subject cannot be Love; and Karsten is, no doubt, right in holding that Empedokles brought in the simile of a baker here. Cf. the "ovens" of v. 199, and the image implied in v. 216.

now come into being, how both tall trees and the fishes of the
sea (arose). . . .
215 And even as at that time Kypris, plying her pleasant task,
after she had moistened the Earth in water, gave it to swift fire
to harden it. R. P. 135*d*.
All of those which are dense within and rare without, having
received a moisture of this kind at the hands of Kypris. . . .
And so tall trees bear eggs, first of all olives. . . .
220 Wherefore late-born pomegranates and blooming apples.[70] . . .
Wine is the water putrefied in the wood, under the bark.
For, if thou takest them (trees and plants) to the close
recesses of thy heart and watchest over them kindly with fault-
less care, then thou shalt have all these things in abundance
225 throughout thy life, and thou shalt gain many others from
them; for each grows ever true to its own character, according
as its nature is. But if thou strivest after things of a different
kind, as is the way with men, ten thousand woes await thee to
blunt thy careful thoughts. All at once they will cease to live
230 when the time comes round, desiring each to reach its own
kind; for know that all things have wisdom and a share of
thought.
Love hates necessity.[71]
This thou mayest see in the heavy-backed shell-fish that
dwell in the sea, in *mænæ* and *buccinia* and the stony-skinned
235 turtles. In them thou mayest see that the earthy part dwells
on the uppermost surface.
Hair and leaves, and the thick feathers of birds, and the
scales that grow on mighty limbs, are the same thing.
But the hair of hedgehogs is sharp-pointed and bristles on
their backs.
240 . . . Out of which (Fire and Water) divine Aphrodite
fashioned unwearying eyes . . . Aphrodite working them
together with the rivets of love . . . since they first grew
together in the hands of Kypris.

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[70] These fragmentary lines are what remains of the Empedoklean theory of fruits. Apparently it was explained that pomegranates and apples had many seeds instead of a single kernel, because they ripen late.

[71] Stein has taken rather more than this from Plutarch, perhaps rightly.

. . . the liver full of blood.

It (Love) made many heads spring up without necks, and
arms wandered bare and bereft of shoulders. Eyes strayed up 245
and down in want of foreheads. R. P. 137*a*.

. . . this marvellous mass of mortal limbs. At one time all
the limbs that are the body's portion are brought together into
one by Love, and flourish in the high season of life; and again,
at another time they are severed by cruel Strife, and wander 250
each in different directions by the breakers of the sea of life.
It is the same with shrubs and the fish that make their homes
in the waters, the beasts that make their lairs in the hills, and
the birds that sail on wings. R. P. 137*a*.

But, as divinity was mingled still further with divinity, these
things joined together as each might chance, and many other 255
things beside them continually arose. Many creatures with
faces and breasts looking in different directions were born;
some, offspring of oxen with faces of men, while others, again,
arose as offspring of men with the heads of oxen, and creatures
in whom the nature of women and men was mingled, furnished 260
with sterile[72] parts. R. P. 137*b*.

. . . Shambling oxen with undivided hoofs.[73] . . .

Come now, hear how the Fire as it was separated caused the
night-born shoots of men and tearful women to arise; for my
tale is not off the point nor uninformed. Whole-natured forms 265
first arose from the earth, having a portion both of water and
fire.[74] These did the fire, desirous of reaching its like, cause to
grow, showing as yet neither the charming form of women's
limbs, nor yet the voice and parts that are proper to men.
R. P. 137*c*.

. . . But the substance of (the child's) limbs is divided 270
between them, part of it in men's and part in women's (body).

And upon him came desire as he mingled with her through sight.

. . . And it was poured out in the pure parts; and when it met with cold women arose from it.

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[72] Reading στείροις with Diels, *Hermes*, xv. *loc. cit.*

[73] Reading ἀκριτόχηλα with Karsten.

[74] Retaining εἴδεος (*i.e.* ἴδεος), which is read in the MSS. of Simplicius. Cf. v. 99, *n.* 48.

275 . . . The two diverging harbours of Aphrodite.
For in its warmer part the womb brings forth males, and that
is why men are darker, more sinewy,[75] and more hairy.
Just as when rennet rivets and binds white milk. . . .
280 On the tenth day of the eighth month the white putrefaction[76] arose.
Know that effluences flow from all things that have come
into being. R. P. 132*h*.
So sweet lays hold of sweet, and bitter rushes to bitter; acid
comes to acid, and warm couples with warm.
285 Water fits better into wine, but it will not (mingle) with oil.
R. P. 132*h*.
The bloom of scarlet dye mingles with the gleaming linen.
Thus[77] do all things draw breath and breathe it out again.
All have bloodless tubes of flesh extended over the surface of
290 their bodies; and at the mouths of these the uttermost surface
of the skin is perforated all over with pores closely packed
together, so as to keep in the blood while a free passage is cut
for the air to pass through. Then, when the yielding blood
recedes from these, the bubbling air rushes in with an impetuous
surge; and when the blood runs back it is breathed out again.
295 Just as when a girl, playing with a water-clock[78] of shining
brass, puts the orifice of the pipe upon her comely hand, and

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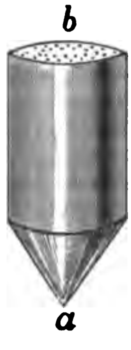
[75] Reading with Diels (*Hermes*, xv. *loc. cit.*): ἐν γὰρ θερμοτέρῳ τοκὰς ἄρρενος ἔπλετο γαστήρ, and ἰνωδέστεροι for ἀνδρωδέστεροι.

[76] This extraordinary phrase evidently means milk. Perhaps there is a punning allusion to πυός, "beestings," which, however, has the first vowel long.



[77] This important passage is quoted by Arist. *De Resp.* 473*a*. The fact that the form is that of a Homeric simile should not blind us to the truth that what we have here is really an *experiment*.

[78] The shape of the *klepsydra* is shown by the annexed figure. The water escaped drop by drop through a single orifice at *a*. The top *b* was not altogether open, but was perforated so that the air might exert its pressure on the water inside. The instrument was filled by plunging it in water *upside down*, and stopping the orifice at *a* with the finger before taking it out again. The αὐλοῦ πορθμός (v. 296) and the πορθμὸς ἠδὲ πόρος (v. 303) signify the orifice at *a*, while the τρήματα πυκνά (v. 299) and the πύλαι ἠθμοῖο (v. 305) are the perforations at *b*.

dips the water-clock into the yielding mass of silvery water,—
the stream does not then flow into the vessel, but the bulk of
the air inside, pressing upon the close packed perforations,
keeps it out till she uncovers the compressed stream; but then 300
air escapes and an equal volume of water runs in. Just in the
same way, when water occupies the interior of the brazen vessel
and the opening and passage is stopped up by the human hand,
the air outside, striving to get in, keeps back the water at the
gates of the sounding strainer,[79] pressing upon its surface till 305
she lets go with her hand. Then, on the contrary, just in the
opposite way to what happened before, the wind rushes in and
an equal volume of water runs out to make room. Even so,
when the thin blood that surges through the limbs rushes backwards to the interior, straightway the stream of air comes in 310
with a rushing swell; but when the blood returns the air
breathes out again in equal quantity.

. . . .

(The dog) with its nostrils tracking out the fragments of the beast's limbs, which the tender breathing of its feet has left in the copse.[80]

. . . .

Thus all things have their share of breath and smell.

. . . .

The fleshy sprout (of the ear).[81] 315

And even as when a man,[82] thinking to sally forth through a
stormy night, gets him ready a lantern, a flame of flashing fire,
fastening to it horn plates to keep out all manner of winds;
and they scatter the blast of the winds that blow, but the 320
light leaping out through them shines across the threshold
with its unyielding rays inasmuch as it is finer; even so did

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[79] Reading ἠθμοῖο with Sturz. The reference must be to the perforations at *b*. The epithet δυσηχέος must surely be wrong.

[80] See Diels, *Hermes*, xv. *loc. cit.* We must read κέρματα with Buttmann and not τίλματα.

[81] Diels (*Emp. u. Gorg.* p. 362) has retracted the emendation σάρκινον ὀστοῦν which he proposed in his note on Theophr. *de Sens.* 9 (*Dox.* p. 501), comparing v. 348.

[82] On this corrupt and difficult passage see Diels in *Hermes*, xv. 171, and Blass in *N. Jahrb. f. Phil. u. Päd.* 1883, p. 19. In v. 318 I transpose the comma after ἅψας, and in v. 325 I read διίεσκεν with the latter.

love surround the elemental fire in the round pupil and confine it with membranes and fine tissues, which are pierced through and through with innumerable passages. They keep out the deep water that surrounds the pupil, but they let through the fire, inasmuch as it is finer. R. P. 139*d*.

. . . .

One vision is produced by both the eyes.

. . . .

(The heart), dwelling in the sea of blood that runs in opposite directions, where men's thoughts chiefly revolve; for the blood round the heart is the thought of men. R. P. 139*e*.

. . . .

For the wisdom of men grows according to what is before them. R. P. 139 B.

And just so far as they grow to be different, so far do different thoughts ever present themselves to their minds (in dreams).[83] R. P. 139*c*.

. . . .

For it is with earth that we see Earth, and Water with water; by air we see bright Air, by fire destroying Fire. By love do we see Love, and Hate by grievous hate. For out of these are all things formed and fitted together, and by these do men think and feel pleasure and pain. R. P. 139 A and C.

BOOK III.

If ever, as regards the things of a day, immortal Muse, thou didst deign to take thought for my endeavour, then stand by me once more as I pray to thee, O Kalliopeia, as I utter a pure discourse concerning the blessed gods. R. P. 140 A.

Blessed is the man who has gained the riches of divine wisdom; wretched he who has a dim opinion of the gods in his heart. R. P. 140 B.

It is not possible for us to set God before our eyes,[84] or to

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[83] That the reference is to dreams we learn from Simpl. *De An. f.* 56*v*.

[84] On the construction here see Diels, *Hermes*, xv. *loc. cit.*

lay hold of him with our hands, which is the broadest way of 345
persuasion that leads into the heart of man. For he is not
furnished with a human head on his body, two branches do
not sprout from his shoulders, he has no feet, no swift knees,
nor hairy parts; but he is only a sacred and unutterable mind 350
flashing through the whole world with rapid thoughts. R. P.
140 C, D.

PURIFICATIONS.

Friends, who inhabit the great town below the yellow rock
of Akragas and up on the heights of the city,[85] busy in goodly
works, safe harbours for the stranger that claims respect, men
unskilled in meanness, all hail. I go about among you an 355
immortal god, no mortal now, honoured by all as is meet,
crowned with fillets and flowery garlands. Straightway,
whenever I enter with these into the flourishing towns,
reverence is done me by men and women; they go after me
in countless throngs, asking of me the way to gain; some 360
desiring oracles, while some, who for many a weary day have
been pierced by the grievous pangs of all manner of sickness,[86]
beg to hear from me the word of healing. R. P. 129 F.

But why do I harp on these things, as if it were any
great matter that I should surpass mortal, perishable men? 365

Friends, I know indeed that truth is in the words I shall
utter, but for men the assault of belief upon their hearts is
grievous and hateful.

There is a decree[87] of necessity, an ancient ordinance of the

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[85] After quoting these verses, D. L. viii. 54 adds, according to Cobet's text, *μέγαν δὲ τὸν Ἀκράγαντα εἰπεῖν φησὶ Ποταμίλλα, ἑπτὰ* (numeral omitted?) *μυριάδες αὐτὸν κατῴκουν.* This lady is otherwise unknown to fame, and the Palatine MS. reads *ποταμὸν ἄλλοι.* This is clearly a gloss, intended to point out that, while Timaios apparently supposed the "Akragas" of v. 352 to be the city, others held it to be the river. (Sturz, *præf.* p. xxix.). I believe that the rock is meant, and insert *τ'* after *πόλιος* in order to get the proper antithesis between the *ἄστυ* down by the river, and the *πόλις* up on the rock. If there is any objection to calling the rock yellow, we may read *ζαθέου* with Bergk.

[86] Reading *εἰ δέ τι νούσων* with Bergk.

[87] Adopting the emendation of Bernays, *ῥῆμα* for *χρῆμα*, communicated by Diels to Kern (*Arch.* i. 505). Gorgias, the pupil of Emp., speaks

370 gods, eternal and sealed fast by broad oaths, that whenever one
of the dæmons, whose portion is length of days, sinfully
pollutes his hands with blood,[88] he must wander thrice ten
thousand seasons from the abodes of the blessed, being born
375 throughout the time in all manners of mortal forms, changing
one toilsome path of life for another. For the mighty Air
drives him into the Sea, and the Sea spews him forth on the
dry Earth; Earth tosses him into the beams of the blazing
380 Sun, and he flings him back to the eddies of Air. One takes
him from the other, and all reject him. One of these I now
am, an exile and a wanderer from the gods, the bondsman of
insensate strife. R. P. 141 A.

For I have been ere now a boy and a girl, a bush and a bird and a glittering[89] fish in the sea. R. P. 141 B.

. . . .

385 I wept and I wailed when I saw the unfamiliar land
where were Birth and Sudden Death and troops of Dooms
besides, and loathsome sicknesses and putrefactions and fluxes.[90]
R. P. 141 C.

. . . .

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of an ἀνάγκης ψήφισμα (*Emk. Hel.* p. 94). Necessity is an Orphic personage.

[88] I retain φόνῳ and omit v. 372, with Knatz (*Empedoclea*, p. 6), as a marginal gloss from Hes. *Theog.* 793. The form ἁμαρτήσας is incredible.

[89] I do not profess to know what ἔλλοπος means, but the common rendering "dumb" rests only on the absurd ancient etymologies given in Karsten's note. I suspect that ἔλλος is really the source of the intensive αἰόλλω. We find the word and its cognates applied to fawns (*Od.* xix. 228), fish (Soph. *Ai.* 1297), small birds and young snakes (Hesych. *s.v.* ἐλλοπίδες). The original sense, then, would seem to be ποικίλος. Cyril reads φαίδιμοι, and Cedren adds καὶ ἐν Ὀλυμπίᾳ βοῦς. This last touch refers to the bloodless sacrifice offered by Emp. at Olympia (cf. *n.* 96).

[90] I read φόνος τε τόκος τε with Knatz (*Emp.* p. 9); Theon of Smyrna paraphrases the words by γένεσις καὶ φθορά. We have here an application of the commonplace that the first thing new-born children do is to cry. Virgil's description of Orcus (*Aen.* vi. 273 sqq.) is modelled either on this or a common Orphic source, more probably the latter. I have followed Stein's view as to v. 387. He says, "versus Karstenio suspectus: immerito; nam ἔργα τε ῥευστά, in quibus seriorem ætatem odoratus est, aut *sudor* intellegenda sunt aut *fœdum morbi genus.*"

They wander in darkness up and down the meadow of Ate.

. . . .

Robbed of the blessed life.

. . . .

From what honour, from what a height of bliss have I fallen 390
to go about among mortals here on earth.

. . . .

We have come down under this roofed-in cave.[91]

. . . .

There were[92] Chthonie and far-sighted Heliope, bloody Discord and gentle-visaged Harmony, Kallisto and Aischre, Speed 395
and Tarrying, lovely Truth and dark-faced Uncertainty, Birth and Decay, Sleep and Waking, Movement and Immobility, crowned Majesty and Meanness, Silence and Voice. R. P. 141*e*.

. . . .

Alas, O wretched race of mortals, twice unblessed: such 400
are the strifes and groanings from which ye have been born!

. . . .

(The goddess) clothing them with a strange garment of flesh.[93]

. . . Earth that envelops the man.

From living creatures he made them dead, changing their forms.[94]

. . . .

Nor had they[95] any Ares for a god nor Kydoimos, no nor 405
King Zeus nor Kronos nor Poseidon, but Kypris the Queen. . . .

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[91] According to Porphyry, who quotes this line (*De Antro Nymph*, c. 8), these words were spoken by the "powers" who conduct the soul into the world. The "cave" is not originally Platonic but Orphic.

[92] This passage is closely modelled on the Catalogue of Nymphs in *Il.* Σ, 39 sqq. Chthonie is found already in Pherekydes (D. L. i. 119); Heliope is probably the moon. The text becomes corrupt near the end, but I have given what seems to be the meaning.

[93] I have retained ἀλλόγνωτι as nearer the MSS., though a little hard to interpret. On the subsequent history of the Orphic *chiton* in gnostic imagery see Bernays (*Theophr. Schr.* n. 9). It was identified with the coat of skins made by God for Adam.

[94] Retaining the MS. reading with Diels, *Hermes*, xv. *loc. cit.*

[95] The dwellers in the Golden Age.

Her did they propitiate with holy gifts, with animals kneaded
out of meal[96] and perfumes of cunning fragrancy, with
410 offerings of pure myrrh and sweet-smelling frankincense,
casting on the ground libations of brown honey. And the
altar did not reek with pure bull's blood, but this was held in
the greatest abomination among men, to eat the goodly limbs
after tearing out the life. R. P. 142 B.

. . . .

415 And there was among them a man of rare knowledge, most
skilled in all manner of wise works, a man who had won the
utmost wealth of wisdom; for whensoever he strained with
all his mind, he easily saw everything of all the things
420 that are now (though he lived) ten, yea twenty generations of
men ago.[97]

For all things were tame and gentle to man, both beasts and birds, and friendly feelings were kindled everywhere. Trees flourished with perpetual leaves and with perpetual fruit, hanging down[98] with abundance of fruit all the year round. R. P. 142*a*.

. . . .

425 This is not lawful for some and unlawful for others; but the
law for all extends everywhere, through the wide-ruling air and
the infinite light of heaven. R. P. 142 A.

. . . .

Will ye not cease from this accursed slaughter? See ye not that ye are feasting on one another in the thoughtlessness of your hearts. R. P. 142*b*.

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[96] The MSS. of Porphyry have *γραπτοῖς τε ζώοισι*, which is out of the question. Nor does the emendation of Bernays (adopted in R. P.) convince me. I venture to suggest *μακτοῖς*, on the strength of the story related by Favorinus (ap. D. L. viii. 53) as to the bloodless sacrifice offered by Emp. at Olympia. Cf. Ath. *Deipn.* p. 3 E; Philostr. *V. Apoll.* i. 1; Souidas, *s.v.* Ἐμπ.

[97] These lines were already referred to Pythagoras by Timaios (D. L. viii. 54). The difficulty is that he did not live ten, not to speak of twenty, generations before Emp. Nor is the suggestion of Diels (*Hermes*, xv. p. 161, *n.* 2), that earlier embodiments of Pythagoras, as Hermotimos, Euphorbos, etc., are meant, very convincing. A comparison of v. 418 and v. 405 suggests that Emp. is still speaking of the Golden Age, and I have little doubt that Orpheus is the personage referred to. But the allusion must have been vague, for D. L. tells us (*loc. cit.*) that "some" even thought of Parmenides.

[98] Reading *κατήορα* with Lobeck.

. . . .

And the father lifts up his own son in a changed form and 430
slays him with a prayer. Infatuated fool! And they are
dragged along begging mercy from the madman, while he, deaf
to their cries, slaughters them in his halls and gets ready the
evil feast. In like manner does the son seize his father, and
children their mother, tear out their life and eat their flesh. 435
R. P. *ib.*

. . . .

Ah, woe is me that the pitiless day of death did not destroy me ere ever I wrought evil deeds of devouring with my lips! R. P. *ib.*

. . . .

Among beasts they[99] become lions that make their lair on the hills and their couch on the ground; and laurels among trees with goodly foliage. R. P. 141*b*.

. . . .

Abstain wholly from laurel leaves. 440

. . . .

Wretches, utter wretches, keep your hands from beans!

. . . .

Wash your hands, cutting the water from five springs in the unyielding brass.[100] R. P. 153, *n*. 1.

. . . .

Fast from wickedness! R. P. *ib.*

. . . .

Therefore are ye distraught by grievous wickednesses, and 445
will not unburden your souls of wretched sorrows.

But, at the last, they appear among mortal men as prophets,
song-writers, physicians, and princes; and thence they rise up
as gods exalted in honour, sharing the hearth of the other gods 450
and the same table, free from human woes, safe from destiny,
and incapable of hurt. R. P. 141*c*.

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[99] Those who have purified themselves.

[100] For the metaphor of "cutting" water here, cf. Vahlen on Arist. *Poet.* 21, 1457*b*, 13, and Diels, *Hermes*, xv. 173. The use of brass or bronze in such ceremonies is universal.

Empedokles and his predecessors.

84. At the very outset of his poem, Empedokles is careful to mark what he conceives to be the difference between himself and all previous inquirers. He speaks almost angrily of those who, though their experience was only partial, professed to have found the whole (v. 7); and it is clear from v. 11 that some pretty strong language on the subject must have immediately preceded it. No doubt he is thinking mainly of Parmenides. His own position is not, however, a sceptical one. He only deprecates the attempt to construct a theory of the universe offhand instead of simply trying to understand each thing we come across "in the way in which it is clear" (v. 19). And this means that we must not, like Parmenides, reject the assistance of the senses (v. 22); for, weak though they are, they are the only channels through which knowledge can enter our minds at all. We must make use of them all and neglect the testimony of none, not even that of taste (v. 21).

After an exordium of this kind, we naturally look for nothing but modest scientific research; but we soon discover that Empedokles is not very mindful of his own warnings. He, too, sets up a system which is to explain everything, though that system is no longer monistic. We need not, however, be too hard on him for this. He is by no means the only philosopher who has himself fallen into the very same error that he was able to see quite clearly in the case of others. As Diels puts it, his natural dogmatism gradually gains the upper hand, and that is all.

Zeller holds that the system of Empedokles was an attempt to mediate between Parmenides and Herakleitos. It is, however, very difficult to find any trace of specially Herakleitean doctrine in it. It would be truer to say that he aimed at mediating between Eleaticism and the evidence of his senses. The connexion with Parmenides is, however, quite obvious. He repeats, almost in the same words, the Eleatic argument for the sole reality and indestructibility of "what *is*" (vv. 45–54, 91–93); and his idea of the "Sphere" is clearly derived from the Parmenidean description of the universe as it truly is.[101] Parmenides had held that the reality which underlies the illusory world presented to us by the senses was a corporeal, spherical, continuous, eternal, and immovable *plenum*, and it is from this that Empedokles starts; it forms, as it were, the problem which he sets himself to solve. Given the sphere of Parmenides, he seems to have said, how are we to get from it to the world as we know it? How are we to introduce motion into the immovable *plenum?* Now Parmenides need not have denied in the abstract the possibility of motion within the Sphere, though he was bound to deny all motion of the Sphere itself; but such an admission on his part, had he made it, would not have served to explain anything. If any part of the Sphere were to move, the room of the displaced matter must at once be taken by other matter, for there is no empty space. This matter, however, would be of precisely the same kind as the matter it had displaced; for all "that *is*" is one. The nett result of the motion would, then, be precisely the same as that of rest; it could account for no change. But, Empedokles must have asked, is this assumption of perfect homogeneity in the Sphere absolutely necessary? Evidently not; it is simply the old unreasoned feeling (§ IV.), that all existence must be fundamentally one. If, instead of this, we were to assume a number of really existent things, it would be quite possible to apply all the predicates of Parmenidean reality to each of them, and all the forms of existence we know might be explained by the mingling and separation of those ultimate realities. The conception of "elements," to use a later term,[102] was found, and the required formula follows at once. So far as regards particular things, it is true, as our senses tell us, that they come into being and pass away; but, if we have regard to the ultimate elements of which they are composed, we shall say with Parmenides that "what *is*" is uncreated and indestructible (vv. 69–73).

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[101] Cf. Emp. 138 with Parm. 103. Observe, too, the clearly intentional contrast of Emp. 86 and Parm. 112.

The four elements.

85. The elements or "roots of all things" (v. 33) which Empedokles assumed were the four which have since become traditional, Fire, Air, Earth, and Water The great distinction between this list and everything that had preceded it is the recognition of Air as something which really exists. It is neither confused, on the one hand, with empty space, which Empedokles denied altogether (v. 91); nor, on the other, with mere vapour or mist exhaled by the sea (*ἀήρ*). That Empedokles was quite clear as to the corporeal nature of what we call Air, is proved by the account he gives of respiration (v. 287 sqq.), and the experiment with the *klepsydra* by which this account was supported; but we see also from the same passage that he did not call it *ἀήρ*, as later writers do, but *αἰθήρ*, a word which is generally best rendered by "sky" in English. The word *ἀήρ*, on the

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[102] Eudemos said (ap. Simpl. *Phys*. 7. 13 D) that Plato was the first to use the word στοιχεῖον, properly the elementary sound represented by a letter, in the sense of "element." This is confirmed by the way the word is introduced in *Theait*. 201 E. The original term was μορφή.

other hand, was never used in this sense by Empedokles himself, but always meant the moist vapour which rises from the sea. In the actual remains of the poem it occurs but once, and clearly with this meaning (v. 132); we shall see, however, when we come to the theory of sensation (§ 95), that it was also referred to elsewhere and identified with water. Now, from this peculiarity of nomenclature a vast deal of confusion has arisen. Later writers mostly substitute the more usual word in their accounts of Empedokles. In this, taken by itself, there is no harm; for there is no doubt that the philosopher meant by the one word exactly what they meant by the other. In translating the fragments I have therefore followed their example, and written Air throughout when Empedokles speaks of this element. If we make this transposition, however, we must find some other word for the moist vapour, and this later writers, as a rule, failed to do. We shall see presently how this piece of carelessness has confused what they say. I have here, as elsewhere, used the word *Mist* for the steam from the sea which condenses into wind and clouds. This will prevent all confusion.

The mythological names which Empedokles gave to the four "roots" are, in the main, an accident of the poetical form in which he saw fit to cast his system. Possibly we may see in them the influence of Orphic ideas; but they no more imply real personification than the reference to the sphere as a god in v. 142, or the identification of the world or worlds with a god or gods by Anaximander, Anaximenes, or Xenophanes. We might, therefore, pass these names by in silence, if it were not that there has been a great deal of controversy as to their appropriation to the various elements, and that this controversy throws a very interesting light on the confusion with regard to Air which we have just been discussing. In vv. 33–35, then, we read of "shining Zeus, life-bringing Hera, Aidoneus, and Nestis." As to the last of these there can be no doubt; whether she was a Sicilian goddess or not, the description given of her shows that she must stand for Water. Nor has any one doubted till quite recently[103] that Zeus must stand for Fire; the whole controversy has hitherto turned on the other two. In antiquity some, following the Homeric allegorists, made Hera the Earth and Aidoneus the Air, a view which has found its way into Stobaios. Its origin is as follows. It was the aim of the "allegorists" to find in Homer the sources of all philosophy; and they assumed accordingly that Empedokles must have borrowed the Homeric "Air" or mist. Now this is the dark element, and therefore it is fitly represented by Aidoneus. Again, "life-bringing" was an old epithet of the earth. The other view identified Hera with the Air and Aidoneus with the Earth, and this latter opinion has been almost unanimously adopted in modern times.[104] On the other hand, if we bear in mind that it was "shining 'æther,'" and not dark "air," that Empedokles made an element, we shall be disposed to accept Fr. Knatz's view that the sky-god, Zeus, was meant to stand for this. The Homeric allegorists saw as much, but they made the mistake of identifying the "æther" with Fire, a meaning which it certainly has with Anaxagoras. As for Aidoneus, nothing can be more natural than that a Sicilian poet, with the hot springs and volcanic phenomena of his country in mind, should regard the god of the lower world as a fire-god. We conclude, then, that "Nestis" is Water; "Aidoneus," Fire; "life-bringing Hera," Earth; and "shining Zeus," the sky or æther. For Zeus was always associated with the bright blue sky in Greek minds, and the Air of Empedokles is referred to as "heaven" in one passage (v. 187). The dark air or mist is no element at all, but a form of Water.

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[103] Fr. Knatz, *Empedoclea* (*Schedæ Philologicæ Hermanno Usener oblatæ* [1891], p. 1 sqq.).

[104] On all this see Diels, *Dox.* p. 88 sqq.

Empedokles regarded the "roots" of all things as eternal. Nothing can come from nothing or pass away into nothing (v. 48 sqq.); what is *is*, and there is no room for coming into being and passing away (v. 90 sqq.). Further, Aristotle tells us, he taught that they were unchangeable.[105] This Empedokles expressed by saying that they "are what they are" (vv. 94, 108), and are "always alike" (v. 95). Again, they are all "equal" (v. 87),—a statement which puzzled Aristotle,[106] but is quite intelligible from the naively realistic standpoint of Empedokles. Above all, the elements are ultimate. All other bodies, Aristotle tells us,[107] might be divided till you came to the elements; but Empedokles could give no account of those without saying (as he does not) that there is an element of which Fire and the rest are in turn composed. This criticism comes merely to this, that Empedokles falls short of giving a complete account, because he spoke neither of a single substratum of all the elements nor of ultimate atoms. In other words, he was forced by the stage of development at which he stood to be a pluralist, but he was not a sufficiently thoroughgoing one (§ 80). In one place,[108] Aristotle goes so far as to suggest that he really meant to expound a view very similar to the atomic theory, though he did not succeed in doing so clearly; and this hint was not lost upon later writers, who had a praiseworthy but unintelligent desire to read into early thinkers all the later doctrine they possibly could. So we actually find the theory of "elements before the elements" referred to Empedokles in the doxographers, in spite of Aristotle's express statements to the contrary.[109]

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[105] *Gen. Corr.* B, 1. 329*b*, 1.

[106] *Gen. Corr.* B, 6. 333*a*, 16.

[107] *Gen. Corr.* A, 8. 325*b*, 19 (R. P. 131*f*).

[108] *De Cælo* Γ, 6. 305*a*, 1.

Empedokles was quite confident that his "four roots" were an exhaustive enumeration of the elements (vv. 96 sqq., 127 sqq.). This confidence was based upon his belief that they sufficiently accounted for all the qualities presented by the world to the senses; Fire accounted for light and heat, Water for darkness and cold, Earth for solidity and hardness (v. 98 sqq.). We have no record of the qualities ascribed to Air, except that it receives the epithet "bright."

Aristotle twice[110] makes the statement that, though Empedokles assumes four elements, he treats them as two, opposing Fire to all the rest. This, he says, we can see for ourselves from his poem. So far as the general theory of the elements goes, it is impossible to see anything of the sort; but, when we come to the origin of the world (§ 90), we shall find that Fire certainly plays a leading part as the source of motion, just as it does in all early cosmologies, and this may be what Aristotle meant. It is also true that in the biology (§§ 92–94) Fire fulfils a unique function, while the other three act more or less in the same way. But we must remember that it has no pre-eminence over the rest; all are equal.

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[109] So Aetios, i. 13. 1 (*Dox.* p. 312), and i. 17. 3 (*Dox.* p. 315).

[110] *Met.* A, 4. 985*a*, 31; *Gen. Corr.* B, 3. 330*b*, 19 (R. P. 131*g*).

Strife and Love.

85*. Empedokles starts, as we have seen, from an original state of the "four roots," which only differs from the Sphere of Parmenides in so far as it is a mixture, and not a perfectly homogeneous and continuous mass. The fact that it is a mixture of completely heterogeneous substances makes change and motion possible; but, were there nothing outside the Sphere which could enter in, like the Pythagorean "Air," to separate these substances, nothing could ever arise from them. Empedokles accordingly assumed the existence of such a substance, and he gave it the name of Strife, in accordance with the usual terminology of cosmologists since the time of Anaximander. Now the effect of this alone would be to separate all the elements in the Sphere completely, and then nothing more could possibly happen; something else was needed to bring the elements into union once more. This Empedokles found in Love, which he regarded as the same impulse to union that is implanted in human bodies (vv. 82–86). He looks at it, in fact, from a purely physiological point of view, and not at all as the Pythagoreans and Herakleitos had regarded Harmony. The difference characterises in a striking way the increased interest in physiological matters which marked the fifth century B.C. This was connected with the rise of scientific medicine, and we have seen that Empedokles was supposed to have had a share in that movement. For the rest, he is not a little proud of his physiological generalisation. No mortal had yet marked, he says, that the very same Love which men know in their bodies had also a place among the gods, that is, a cosmological significance (v. 35 and *n.*).

It is most essential to observe that the Love and Strife of Empedokles are no incorporeal forces, but corporeal elements just like the other four. At the time, this was inevitable; nothing incorporeal had yet been dreamt of. Naturally Aristotle is not a little puzzled by this characteristic of what he regarded as efficient causes. "The Love of Empedokles," he says,[111] "is both an efficient cause, for it brings things together, and a material cause, for it is a part of the mixture." And Theophrastos expressed the same idea by saying[112] that Empedokles sometimes gave an efficient power to Love and Strife, and sometimes put them on a level with the other four. The verses of Empedokles himself leave no room for doubt that the two were thought of as spatial and corporeal. All the six elements are called "equal" (v. 87). Love is said (v. 80) to be "equal in length and breadth" to the other elements, and Strife is described (v. 79) as equal to each of them in weight.

The function of Love is to produce union; that of Strife, to break it up again. Aristotle, however, quite correctly points out[113] that in another sense it is Love that divides and Strife that unites. When the Sphere is broken up by Strife, the result is that all the Fire, for instance, which was contained in it comes together and becomes one; and again, when the elements are brought together once more by Love, the "heaped up mass" (v. 145) of each of them is divided. In another place, Aristotle says that, while Strife is assumed as the cause of destruction, and does, in fact, destroy the Sphere, it really gives birth to everything else in so doing. It follows that we must carefully distinguish between the Love of Empedokles and that "attraction of like for like" to which he also attributed an important part in the formation of the world. This latter attraction is not an element distinct from the others; it depends simply, as we shall see, upon the proper nature of each element, and it is only able to take effect when Strife divides the Sphere. Love, on the contrary, is something that comes from outside and produces an attraction of *unlikes*.

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[111] *Met.* Λ, 10. 1075*b*, 3.

[112] *Phys. Op.* fr. 3 (*Dox.* p. 477); ap. Simpl. *Phys.* 25 D (R. P. 132*b*).

[113] See the passages quoted R. P. 132*i*.

Mixture and separation.

86. This brings us naturally to the question of how Empedokles conceived the mixture and separation of elements to operate. When Strife has once separated them, what is it that determines the direction of their motion? In his poem Empedokles seems to have given no further explanation of this than that each "happened to run" in a certain direction (v. 167). Plato severely condemns this in a well-known passage of the *Laws*,[114] on the ground that no room is thus left for design. Aristotle also blames him for giving no account of the Chance to which he ascribed so much importance. Nor is the Necessity of which he also spoke further explained.[115] Strife enters into the Sphere at a certain time in virtue of Necessity, or "the mighty oath" (v. 141); but we are left in the dark as to the origin of this.

The expression used by Empedokles to describe the movement of the elements is that they "run through each other" (v. 108). Aristotle tells us[116] that he explained mixture in general by "the symmetry of pores." And this is the explanation of the "attraction of like for like." The "pores" of like bodies are, of course, much the same size, and these bodies can therefore mingle easily. On the other hand, a finer body will "run" straight through a coarse one without becoming mixed, and a coarse body will not be able to enter into the pores of a finer one at all. It will be observed that, as Aristotle is not slow to point out, this view really implies something like the atomic theory; but there is no evidence that Empedokles himself was conscious of that. Another question raised by Aristotle is even more instructive. Are the pores, he asks, empty or full? If empty, what becomes of the denial of the void? If full, why need we assume pores at all? These questions Empedokles would have found it hard to answer. They point to a real want of thoroughness in his system, and mark it as a mere stage in the transition from Monism to Atomism.

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[114] X. 889 B.

[115] *Gen. Corr.* B, 6. 334*a*, 1; *Phys.* Θ, 1. 252*a*, 5 (R. P. 132*k*).

[116] *Gen. Corr.* A, 8. 324*b*, 34 (R. P. 132*h*).

The four periods. 87. From all that has just been said, it will be clear that we must distinguish four periods in the cycle of change. First of all, we have the Sphere in which all the elements are mixed together by Love. Secondly, there is the period when Love is passing out and Strife coming in, when, therefore, the elements are partially separated and partially combined. Thirdly, comes the complete separation of the elements, when Love is banished entirely from the world, and Strife has given free play to the attraction of like for like. Lastly, we have the period when Love is gradually bringing the elements together once more, and Strife is passing away. This brings us back in time to the Sphere, and then the cycle begins once more. Now it is clear that a world such as ours can exist only in the second and fourth of these periods; and it is clear, too, that, if we are to understand Empedokles, we must discover to which of these two periods our present world belongs. This is plainly the capital question; for the explanation of all details must depend upon whether we are to assume that Love or Strife is now on the increase. It is always, so far as I can see, assumed that we are now living in the fourth period;[117] I hope to show that we are in the second, that is, in the period when Strife is steadily gaining the upper hand.

The present world the work of Strife.

88. That a world of perishable things arises both in the second and the fourth of the periods just enumerated is stated in so many words by Empedokles (vv. 63–65); it is therefore very unlikely that, as Zeller suggests, he himself was not perfectly clear as to which of these we are now living in. Let us look at the external testimony, which, by Zeller's own admission, is entirely in favour of this world's being the second period and not the fourth. Aristotle says in one place[118] quite distinctly: "He holds that the world is in a similar condition *now in the period of Strife* as formerly in that of Love." From another passage[119] it appears that Empedokles altogether omitted to describe the origin of the world in the period of Love, which he could hardly have done if it had been our present world. Against this Zeller has nothing to say except that all the fragments and notices seem to refer to the fourth period. I hope it will appear from the detailed account of the cosmology I am about to give that this is not so, and that the ideas of Empedokles were clearer than Zeller gives him credit for.

The "Sphere."

89. To begin, then, with the "Sphere," in which the four "roots" of all things are thoroughly mixed together

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[117] Zeller, p. 712; Karsten, *Reliquiæ*, ii. p. 392; Tannery, *Science hellène*, p. 308.

[118] *Gen. Corr.* B, 6. 334*a*, 5.

[119] *De Cœlo*, Γ, 2. 301*a*, 14.

by Love. The fragments which deal with this stage are not very numerous (vv. 134–138), as is only natural, seeing that the description of such a state of things would very soon be exhausted. We note, however, that in v. 142 the Sphere is spoken of as a god, and Aristotle more than once[120] refers to it in the same way. We shall come back to this in discussing the Empedoklean theology. More often[121] Aristotle speaks of the Sphere as "the One," a name doubtless derived from such verses as 61, 67, and 76. At the same time, there is clearly a slight Aristotelian "development" here. It is not quite the same thing to say that things come together "into one," as Empedokles has it, and to say that they come together into "the One"; the latter expression suggests that they lose their distinct and proper character in the Sphere, which thus becomes something like the "indeterminate matter" of Aristotle. Such a view was quite foreign to Empedokles; in the Sphere, as in their separation, Fire, Air, Earth, and Water "remain what they are." Aristotle's difficulty as to the unity of the Sphere further led him to the assertion, which he makes, in one place quite positively and in another very doubtfully,[122] that Love was the substratum of "the One" in just the same sense as the Fire of Herakleitos, the Air of Anaximenes, or the Water of Thales. This strange statement we are now in a position to understand. It is by no means enough to say with Karsten that Love here stands for "the reign of Love"; this hardly improves the sense at all. Aristotle could never have said what he does say if he had not been well aware that Love was a corporeal element just as much as the "four roots." He could not understand how the elements could come together "into one," or "into the One," without losing their individuality in it; and he assumes, quite naturally from the standpoint of his own system, that they all become merged in Love; in fact, he is here involved in much the same difficulty as that we have discussed already in the case of Anaximander (§ 14). His doubts arise from the same source, namely, that he insists on trying to apply his own theory of potentiality and actuality to early philosophers who never dreamt of anything like it. His reason for doing this is explained in the *Note on the Sources*, and we must remember that he really was quite well aware that, as a matter of historical fact, he himself had invented "potentiality and actuality," and also that "the One" of Empedokles was really a *mixture*.

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[120] *Gen. Corr.* B, 6. 333*b*, 21 (R. P. 133*h*); *Met.* B, 4. 1000*a*, 29 (R. P. 132*i*). Cf. Simpl. *Phys. f.* 258*r* (R. P. 133*b*).

[121] *Gen. Corr.* A, 1. 315*a*, 7 (R. P. 133*h*); *Met.* A, 4. 985*a*, 28 (R. P. 132*i*); *ib.* B, 4. 1000*a*, 28 (R. P. *ib.*).

[122] *Met.* B, 1. 996*a*, 4; Γ, 4. 1001*a*, 12 (R. P. 133*f*). The second of these passages does not pretend to be anything more than Aristotle's inference. Cf. also *Met.* I, 2. 1053*b*, 15.

It is unnecessary to discuss here the interpretations of later writers like John Philoponos and Simplicius.[123] Sometimes, with Aristotle, they say that the Sphere is a mixture of "actual" or "potential" elements, sometimes it is "indeterminate matter," sometimes "the efficient cause." Lastly, it appears as the Neoplatonist "intelligible world." To us, however, it must be none of these, but simply a round mass containing all the "four roots" thoroughly mixed together by Love, a corporeal substance which pervades the whole of it. Hate, another corporeal substance, is outside, no doubt surrounding the Sphere in a circular layer. This is quite capable of being represented in a spatial perception, as all early Greek philosophical theories are.

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[123] For these see Karsten, ii. pp. 322 sqq. and 369 sqq.

Formation of the world.

90. At the appointed time, Strife begins to enter into the Sphere and Love to go out of it (v. 139 sqq.). The fragments by themselves throw very little light on the details of this process; but fortunately Aetios and the Plutarchean *Stromateis* have between them preserved a very fair tradition of what Theophrastos said on the point.

> Empedokles held that the Air was first separated out and secondly Fire. Next came Earth, from which, highly compressed as it was by the impetus of its revolution, Water gushed forth. From the water Mist was produced by evaporation. The heavens were formed out of the Air and the sun out of the Fire, while terrestrial things were condensed from the other elements.—Aet. ii. 6. 3 (*Dox.* p. 334; R. P. 135 A).
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> Empedokles held that the Air when separated off from the original mixture of the elements was spread round in a circle. After the Air, Fire running outwards, and not finding any other place, ran up under the solid ice that now surrounded the Air. There were two hemispheres revolving round the earth, the one altogether composed of fire, the other of a mixture of air and a little fire. The latter he supposed to be the Night. The origin of their motion he derived from the fact of fire preponderating in one hemisphere owing to its accumulation there.—Ps.-Plut. *Strom.* fr. 10 (*Dox.* p. 582; R. P. 135*a*).

The first of the elements to be separated out by Strife, then, was Air, which took the outermost position surrounding the world (cf. v. 133). We must not, however, take the statement that it surrounded the world "in a circle" too strictly. It appears that Empedokles rather regarded the heavens as shaped like an egg.[124] As Zeller points out, the appearance which it presents to the eye may partially account for this, but it is still more likely that we have here a trace of Orphic ideas. At any rate, the outer circle of the Air became solidified or frozen, and we thus get a crystalline vault as the boundary of the world. We note here the curious view that it was Fire which solidified the Air and turned it to ice. Fire in general had a solidifying power.[125]

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[124] Aet. ii. 31. 4 (*Dox.* p. 363).

In its upward rush (v. 168) Fire displaced a portion of the Air in the upper half of the concave sphere formed by the frozen sky. This air then sunk downwards, carrying with it a small portion of the fire. Thus the two hemispheres, mentioned in the passage from the *Stromateis*, are produced: one, consisting entirely of fire, the diurnal hemisphere; the other, the nocturnal, consisting of air with a little fire.

The accumulation of Fire in the upper hemisphere disturbs the equilibrium of the heavens and causes them to revolve; and this revolution not only produces the alternation of day and night, but serves by its rapidity to keep the heavens and the earth in their respective places. This Empedokles illustrated, Aristotle tells us, by the simile of a cup of water whirled round at the end of a string.[126] The verses which contained this remarkable account of so-called "centrifugal force" have, unfortunately, been lost; but the simile is quite in keeping with the manner of Empedokles.

The sun, moon, stars, and earth.

91. It will be observed that day and night have been explained without the slightest reference to the sun. Day is produced solely by the light of the fiery diurnal hemisphere. What then is the sun? The Plutarchean *Stromateis*[127] again give us the answer: "The sun is not fire in substance, but a reflexion of fire like that which comes from water." Plutarch himself, in his tract,

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[125] R. P. 135*c*.

[126] R. P. 135*b*.

[127] *Strom.* fr. 10 (*Dox.* 582, 11; R. P. 135*c*).

entitled, *Why does the Pythia no longer give Metrical Responses?* makes one of the interlocutors say: "You laugh at Empedokles for saying that the sun is a product of the earth, arising from the reflexion of the light of heaven, and once more 'flashes back to Olympos with untroubled countenance'" (v. 151).[128] Aetios says:[129] "Empedokles held that there were two suns; one, the archetype, the fire in one hemisphere of the world, filling the whole hemisphere [always stationed opposite its own reflexion]; the other, the visible sun [its reflexion in the other hemisphere, that which is filled with air mingled with fire], produced by the reflexion of the earth, which is round, on the crystalline sun, and carried round by the motion of the fiery hemisphere. Or, to sum it up shortly, the sun is a reflexion of the terrestrial fire."

These passages, and especially the last of them, are by no means so clear as we could wish; but they all point to the conclusion that the sun is nothing but the light of the sky reflected from the earth on that part of the sky itself which is opposite to it. From this it follows, of course, that the appearance which we call the sun is the same size as the earth. Perhaps we may explain the origin of this extraordinary view as follows. It had just been discovered that the moon shone by reflected light. There is always a tendency to give any novel theory a far wider application than it really admits of; and so, in the early part of the fifth century B.C., men saw reflected light everywhere; the Pythagoreans held a very similar view. What is quite incomprehensible is how Empedokles could imagine the reflexion which we call the sun to be carried round by the diurnal revolution of the heavens.

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[128] Περὶ τοῦ μὴ χρᾶν ἔμμετρα νῦν τὴν Πυθίαν, 400 B (R. P. *ib.*). We must keep the MS. reading περὶ γῆν with Bernardakis. The reading in R. P. is only a conjecture of Wyttenbach's.

[129] Aet. ii. 20. 23 (*Dox.* p. 350). It seems to me that two inconsistent accounts have been mixed together here. I have indicated this by brackets.

This last consideration shows how incomplete were the scientific ideas of Empedokles, and it is therefore all the more remarkable to find that he was quite aware light takes some time to travel, though its speed is so great as to escape our perception.[130] He can hardly have arrived at this knowledge experimentally; it is an inference from his theory of "effluences."

"The moon," we are told in the *Stromateis*, "was composed of the air cut off by the fire; it was frozen just like hail, and had its light from the sun." It is, in other words, a disc of frozen air, of the same substance as the solid sky which surrounds the heavens. Diogenes says that Empedokles taught it was smaller than the sun, and Aetios tells us that it was only half as distant from the earth.[131]

Empedokles did not attempt to explain the fixed stars by reflected light, nor even the planets. They were fiery, made out of the fire which the air carried with it when forced beneath the earth by the upward rush of fire at the first separation, as we saw above. The fixed stars were attached to the frozen air, the planets were those which moved freely.[132]

Empedokles was acquainted (v. 157 sqq.) with the true theory of solar eclipses, which, along with that of the moon's light, was the great discovery of this period. He also knew (v. 160) that night is simply the shadow of the earth, and not a sort of exhalation, as had been previously supposed.

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[130] Arist. *De Sensu*, 6. 446*a*, 25; *De An.* B, 7. 418*b*, 20.

[131] *Strom.* fr. 10 (*Dox.* 582, 12; R. P. 135*c*); D. L. viii. 77; Aet. ii. 31. 1; cf. *Dox.* p. 63.

[132] Aet. ii. 13. 2 and 5 (*Dox.* pp. 341, 342).

Wind was explained from the opposite motions of the fiery and airy hemispheres. Rain was caused by the compression of the Air, which forced any water there might be in it out of its pores in the form of drops. Lightning was fire forced out from the clouds in much the same way.[133]

Turning now to the earth, we find that it was at first mixed with water, but the increasing compression caused by the velocity of the world's revolution made the water gush forth, so that the sea is called "the sweat of the earth," a phrase to which Aristotle objects as a mere poetical metaphor. This seems reasonable enough, especially as Empedokles went on to explain the saltness of the sea from this analogy.[134]

Organic combinations.

92. The remainder of the First Book seems to have been taken up with an attempt to show how the four elements, mingled in different proportions, gave rise to perishable things, such as bones, flesh, and the like. These, of course, are all the work of Love; but this in no way contradicts the view taken above as to the period of evolution to which this world belongs. Love is by no means banished from the world yet, though one day it will be. At present, it is still able to form all sorts of combinations; but, just because Strife is ever increasing, they are all perishable, and will be resolved once more into the elements.

The possibility of organic combinations depends upon the fact that there is still water in the earth, and even fire (v. 162). The warm springs of Sicily were a proof of this, not to speak of Etna. These springs Empedokles appears to have explained by one of his characteristic images, drawn this time from the heating of warm baths.[135] It will be noted that, while he is thoroughly epic in his treatment of similes, they are nearly all drawn from human inventions and manufactures.

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[133] Aet. iii. 3. 7; Simpl. *De Cælo*, *f.* 155*r*, Arist. *Meteor.* B, 9. 369*b*, 12, with Alexander's commentary.

[134] *Meteor.* B, 3. 357*a*, 24; Aet. iii. 16. 3 (R. P. 135*b*); cf. the clear reference in Arist. *Meteor.* B, 1. 353*b*, 11.

The formation of organic combinations takes place, then, in the earth, which is moistened by water mingled with air and hardened by fire. Here another simile of the same sort seems to have come in; Love was a baker, and the earth her oven (v. 208).

Plants.

93. At the beginning of his Second Book Empedokles went on to explain how plants and animals were formed from the four elements under the influence of Love and Strife. The fragments which deal with trees and plants are vv. 215–231; and these, taken along with certain Aristotelian statements and the doxographical tradition, enable us to make out pretty fully what his views were. We start as usual from Aetios. The text of his statement is very corrupt; but it may, perhaps, be rendered as follows:—

> Empedokles says that trees were the first living creatures to grow up out of the earth, before it was solidified by fire,[136] and before day and night were distinguished; that, from the symmetry of their mixture, they contain the proportion of male and female; that they grow owing to the heat which is in the earth rising upwards,[137] so that they are parts of the earth just as

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[135] Seneca, *Quæst. Nat.* iii. 24: "Facere solemus dracones et miliaria et complures formas in quibus ære tenui fistulas struimus; ut sæpe eundem ignem ambiens aqua per tantum fluat spatii quantum efficiendo calori sat est. frigida itaque intrat, effluit calida, idem sub terra Empedocles existimat fieri."

[136] I propose πρὶν πυρὶ πιληθῆναι (cf. *Plac.* iii. 16; R. P. 135*b*).

[137] I read διαιρομένου for the MS. διαιρουμένου.

embryos are parts of the womb; that fruits are excretions of the water and fire in plants, and that those which have a deficiency of moisture shed their leaves when that is evaporated by the summer heat, while those which have more moisture remain evergreen, as in the case of the laurel, the olive, and the palm; that the differences in taste are due to variations in the particles contained in the earth and to the plants drawing different particles from it, as in the case of vines; for it is not the difference of the vines that makes wine good, but that of the soil which nourishes them.—Aet. v. 26. 4 (R. P. 136).

In the *De Anima*,[138] Aristotle finds fault with Empedokles for explaining the double growth of plants, upwards and downwards, by the opposite natural motions of the earth and fire contained in them. For "natural motions" we must, of course, substitute the attraction of like for like (§ 86). Theophrastos says much the same thing.[139] The growth of plants, then, is to be regarded as an incident in that separation of the elements which Strife is bringing about ever more and more. Some of the fire which is still beneath the earth (v. 162) meeting in its upward course with earth, still moist with water and "running" down so as to "reach its own kind," unites with it, under the influence of the Love still left in the world, to form a temporary combination, which we call a tree or plant.

At the beginning of the pseudo-Aristotelian *Treatise on Plants*,[140] we are told that Empedokles attributed desire, sensation, and the capacity for pleasure and pain to plants. This follows also from v. 230, which is quoted by Sextus in the same connexion.

Further, Empedokles rightly saw that the two sexes are combined in plants. This is mentioned by Aetios, and is discussed in the pseudo-Aristotelian *Treatise on Plants.* If we may so far trust that Byzantine translation from a Latin version of the Arabic, we get a most valuable hint as to the reason. Plants, we are there told, came into being "in an imperfect state of the world,"[141] in fact, at a time when Strife had not so far prevailed as to differentiate the sexes. We shall see shortly that the same remark applies to the original race of animals in this world. It is strange that Empedokles never observed the actual process of generation in plants, but confined himself to the statement that they spontaneously "bore eggs" (v. 219), that is to say, fruit, as a mere excretion. Nevertheless his view as to the relation of the sexes in plants was not rediscovered till shortly before the time of Linnæus, and our botanical nomenclature still bears traces of a view which he had already transcended.[142]

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[138] B, 4. 415*b*, 28.

[139] *De causis plantarum*, i. 12. 5.

[140] A, 1. 815*a*.

The nutritive functions of plants are explained by the symmetry of the pores, and the consequent attraction of like for like. This is the meaning also of what we are told above as to the different flavours of wines. In the same way Empedokles accounted for the fact that some plants are evergreen and others not. Some plants shed their leaves because the pores of their roots are too narrow to take in food as quickly as is required, and those of their leaves too wide to keep it. The evergreens have a symmetry in their pores, so that nourishment comes in continuously.

In respect of nutrition and growth, then, as in respect of generation, plants represent an earlier and less differentiated stage of evolution than animals. They remain a part of the earth which bears them, as the embryo is a part of the uterus.

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[141] A, 2. 817*b*, 35: ἐν κόσμῳ ἠλαττωμένῳ.

[142] For instance, *Filix mas* and the like. See E. H. F. Meyer, *Gesch. der Botanik*, vol. i. p. 55 sq.

Animals. 94. As is well known, Empedokles held that animal organisms were evolved out of all manner of monstrous forms by a sort of survival of the fittest. The difficulties which have been felt as to this part of the system all arise from a failure to observe that he really describes two evolutions of animal organisms which take exactly opposite courses, one belonging to the period of the world's history when Strife is prevailing more and more, the other to that when Love is making headway. If we confuse the two, we cannot expect to attain any clear notion of the theory. The clue is furnished by two passages in Aristotle, where v. 244 is quoted and referred to the period of Love.[143] So, too, in another, the same verse is cited with the additional remark that the separate parts were subsequently united by Love.[144] This is exactly what we should expect; Strife had prevailed, and everything was separated. The evolution of animals in this period is simply a stage in the process of unification which culminates in the Sphere.

Aristotle severely criticises Empedokles for the part which he assigns to chance in the evolution of animals. "We may suppose," he says, "that all things have fallen out accidentally just as they would have done if they had been produced with an end in view. Certain things have been preserved because they were accidentally put together in a fitting manner, while those which were not so put together have perished and are perishing, as Empedokles says of the oxen with human faces."[145] One curious instance of a favourable variation has been handed down. Vertebration was explained by Empedokles as due to an early invertebrate animal having tried to turn round, and broken its back in so doing. This variation was a favourable one, and accordingly survived.[146]

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[143] *De Cælo*, Γ, 2. 300*b*, 29 (R. P. 137*a*); *Gen. An.* A, 18. 722*b*, 19.

[144] *De An.* Γ, 6. 430*a*, 30 (R. P. *ib.*).

In the third period of the cycle, then, the period opposed to the one in which we are now living, the different parts of animals made their appearance separately (v. 244 sqq.); but gradually, as Love increased more and more, these came together and formed various combinations (v. 254 sqq.). Some of these were monstrosities (v. 256 sqq.), and perished from want of adaptation to their environment; those, however, which happened to be suitably constructed survived.

Now let us look at the origin of animals in our period of the world, the period when Hate is increasing. First of all we have "whole-natured forms" (v. 265), in which neither sex nor species are yet distinguished. These are just what we should expect at a time when Hate is only beginning to make its power felt. Later on, when Hate has still further increased, we get the present condition of things with the actual distinctions of sex and species. This account seems to me to explain all the fragments we possess on the subject; I am not aware that it has yet been given.[147]

The cause of growth in animals as in plants is fire striving upwards from desire to reach its like, the fire in the sky (v. 267). They themselves are also composed of fire and water in definite proportions (v. 266).

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[145] *Phys.* B, 8. 198*b*, 29 (R. P. 137*a*).

[146] Arist. *Part. An.* A, 1. 640*a*, 19.

[147] Cf. Aet. v. 19 (R. P. 137), where the four periods are accurately distinguished.

The distinction of the sexes was the most important result of the gradual differentiation brought about by the entrance of Hate into the world. Empedokles differed from the theory given by Parmenides in his Second Part (§ 79) in holding that the warm element preponderated in the male sex, and that males were conceived in the warmer part of the uterus (vv. 273, 278). The fœtus was formed partly from the male and partly from the female semen (v. 270); and it was just the fact that the substance of a new being's body was divided between the male and the female that produced desire when the two were brought together by sight (v. 272). The male semen acts on the female like rennet on milk (v. 279). A certain symmetry of the pores in the male and female semen is, of course, necessary for procreation, and from its absence Empedokles explained the sterility of mules. The children most resemble that parent who contributed most to their formation. The influence of statues and pictures on the fancy of pregnant women was also noted, however, as modifying the appearance of the offspring. Twins and triplets were due to a superabundance and division of the semen.[148]

As to the growth of the fœtus in the uterus, Empedokles held that it was enveloped in a membrane, and that its formation began on the thirty-sixth day and was completed on the forty-ninth. These numbers are the squares of six and seven respectively. The heart was formed first, the nails and such things last. Respiration did not begin till the time of birth, when the fluids round the fœtus were withdrawn. Birth took place in the ninth or seventh month, because the day had been originally nine months long, and afterwards seven. Milk arises on the tenth day of the eighth month.[149]

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[148] Aet. v. 10. 1; 11. 1; 12. 2; 14. 1.

Death was regarded by Empedokles as the final separation by Strife of the fire and earth in the body, each of which had all along been striving to "reach its own kind." Sleep was a temporary separation to a certain extent of the fiery element.[150] At death the animal is resolved into its elements, which perhaps enter into fresh combinations, perhaps become permanently united with the "heaped up mass" of "their own kind." There can, of course, be no question here of an immortal soul.

Even in life, Empedokles held, we may see the attraction of like to like operating in animals just as we saw it operate in the upward and downward growth of plants. Hair is fundamentally the same thing as foliage (v. 236); and, generally speaking, the fiery part of animals tends upwards and the earthy part downwards, though there are exceptions, as may be seen in the case of certain shell-fish (v. 233 sq.). These exceptions are only possible because there is still a great deal of Love in the world. We see the attraction of like for like also in the different habits of the various species of animals. Those that have most fire in them fly up into the air; those in which earth preponderates take to the earth, as did the dog which always sat upon a tile.[151] Aquatic animals are those in which water predominates. This does not, however, apply to fishes, which are very fiery, and take to the water to cool themselves.[152]

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[149] Aet. v. 15. 3; 21. 1; *Dox. Prol.* p. 190.

[150] Aet. v. 25. 4 (*Dox.* p. 437).

[151] Aet. v. 19. 5 (*Dox.* p. 431); cf. Arist. *Eth. Eud.* H, 1. 1235*a*, 11.

[152] Arist. *De Resp.* 14. 478*a*, 8; Theophr. *De caus. plant.* i. 21.

Empedokles paid great attention to the subject of respiration, and his very ingenious explanation of it has been preserved in a continuous form (v. 287 sqq.). We breathe, he held, through all the pores of the skin, not merely through the organs of respiration. The cause of the alternate inspiration and expiration of the breath was the movement of the blood from the heart to the surface of the body and back again, which was explained by an illustration taken from the *klepsydra*. It must be said that this passage gives us a high idea of Empedokles as an observer; he seems to be just on the verge of anticipating both Harvey and Torricelli.

The nutrition and growth of animals is, of course, easily to be explained from the attraction of like to like. Each part of the body has pores into which the appropriate food will fit. Pleasure and pain were derived from the absence or presence of like elements, that is, of nourishment which would fit the pores. Tears and sweat arose from a disturbance which curdled the blood; they were, so to say, the whey of the blood.[153]

Perception.

95. For the theory of perception held by Empedokles we have the original words of Theophrastos:—

> (7.) Empedokles speaks in the same way of all the senses, and says that perception is due to the "effluences" fitting into the passages of each sense. And that is why one cannot judge the objects of another; for the passages of some of them are too wide and those of others too narrow for the sensible object, so that the latter either goes through without touching or cannot enter at all. R. P. 139*d*.
>
> He tries, too, to explain the nature of sight. He says that the interior of the eye consists of fire and water, while round

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[153] Nutrition, Aet. v. 27. 1; pleasure and pain, *ib.* iv. 9. 15; v. 28. 1; tears and sweat, v. 22. 1.

about it is earth and "air,"[154] through which its rarity enables the fire to pass like the light in lanterns (v. 316 sqq.). The passages of the fire and water are arranged alternately; through those of the fire we perceive light objects, through those of the water, dark; each class of objects fits into each class of passages, and the colours are carried to the sight by effluence. R. P. *ib.*

(8.) But eyes are not all composed in the same way; some are composed of like elements and some of opposite; some have the fire in the centre and some on the outside. That is why some animals are keen-sighted by day and others by night. Those which have less fire are keen-sighted in the daytime, for the fire within is brought up to an equality by that without; those which have less of the opposite (*i.e.* water), by night, for then their deficiency is supplemented. But, in the opposite case, each will behave in the opposite manner. Those eyes in which fire predominates will be dazzled in the daytime, since the fire being still further increased will stop up and occupy the pores of the water. Those in which water predominates will, he says, suffer the same at night, for the fire will be obstructed by the water. And this goes on till the water is separated off by the air, for in each case it is the opposite which is a remedy. The best tempered and the most excellent vision is one composed of both in equal proportions. This is practically what he says about sight.

(9.) Hearing, he holds, is produced by sound outside, when the air moved by the voice sounds inside the ear; for the sense of hearing is a sort of bell sounding inside the ear, which he calls a "fleshy sprout." When the air is set in motion it strikes upon the solid parts and produces a sound. Smell, he holds, arises from respiration, and that is why those smell most keenly whose breath has the most violent motion, and why most smell comes from subtle and light bodies. As to touch and taste, he does not lay down how nor by means of what they arise, except that he gives us an explanation applicable to all, that sensation is produced by adaptation to the pores. Pleasure is produced by what is like in its elements and their mixture; pain, by what is opposite. R. P. *ib.*

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[154] That is, watery vapour, not the elemental air or *αἰθήρ* (§ 85). It is identical with the "water" mentioned below.

(10.) And he gives a precisely similar account of thought and ignorance. Thought arises from what is like and ignorance from what is unlike, thus implying that thought is the same, or nearly the same, as perception. For after enumerating how we know each thing by means of itself, he adds, "for all things are fashioned and fitted together out of these, and it is by these men think and feel pleasure and pain" (v. 336 sq.). And for this reason we think chiefly with our blood, for in it of all parts of the body all the elements are most completely mingled. R. P. 139 C.

(11.) All, then, in whom the mixture is equal or nearly so, and in whom the elements are neither at too great intervals nor too small or too large, are the wisest and have the most exact perceptions; and those who come next to them are wise in proportion. Those who are in the opposite condition are the most foolish. Those whose elements are separated by intervals and rare are dull and laborious; those in whom they are closely packed and broken into minute particles are impulsive, they attempt many things and finish few because of the rapidity with which their blood moves. Those who have a well-proportioned mixture in some one part of their bodies will be clever in that respect. That is why some are good orators and some good artificers. The latter have a good mixture in their hands. and the former in their tongues, and so with all other special capacities. R. P. *ib.*

Theophrastos goes on to criticise Empedokles from his own point of view. These objections do not concern us here; what we have to do is to understand the theory itself. Perception is caused by the meeting of an element in us with the same element outside. This takes place when the pores of the organ of sense are neither too large nor too small for the "effluences" which all things are constantly giving off (v. 281). It is not right to make too much of the principle here laid down (v. 333 sqq.) that like is known by like. There is no idea of a necessary correlation between the "reason" in us and "the reason in the world." On the contrary, the knowing subject, if we may call it so, is just as much corporeal through and through as the world outside it. As Zeller points out, the theory is most easily worked out in the case of smell and taste. Smell was explained by respiration. The breath drew in along with it the small particles which fit into the pores. From Aetios[155] we learn that Empedokles proved this by the example of people with a cold in their head, who cannot smell, just because they have a difficulty in breathing. We also see from v. 313 that the scent of dogs was referred to in support of the theory. Hearing was explained by the motion of the air which struck upon the cartilage inside the ear and made it sound like a bell.

The theory of vision is more complicated; and, as Plato adopted most of it, it is of great importance in the history of philosophy. The eye, then, was conceived, as by Alkmaion (§ 79),[156] to be composed of fire and water. Just as in a lantern the flame is protected from the wind by horn (v. 316 sqq.), so the fire in the apple of the eye is protected from the water which surrounds it in the pupil by membranes with very fine pores, so that, while the fire can pass out, the water cannot get in. Sight is produced by the fire inside the eye going forth to meet the object. This seems strange to us, because we are accustomed to the idea of images being impressed upon the retina. We wonder why Empedokles, who came so near the truth about smell and hearing, should have adopted so different an explanation of vision. But if we forget our superior knowledge for a moment, we shall see that, to the plain man, *looking* at a thing seems very much more like an action proceeding from the eye than a mere passive state. There are reasons for this into which we cannot go at present; we need only remark that Empedokles is much more nearly right than any one who supposes that what we actually see is the image on the retina.

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[155] iv. 17. 2 (*Dox.* p. 407).

[156] Theophr. *Sens.* 26.

Empedokles was quite aware, too, that "effluences," as he called them, came from things to the eyes as well; for he defined colours as "effluences from things fitting into the pores and perceived."[157]

Theophrastos tells us that Empedokles made no distinction between thought and perception, a remark which had already been made by Aristotle.[158] It is, of course, perfectly accurate. Reason, the faculty of abstract conception, had not yet been distinguished from perception, any more than incorporeal realities had been distinguished from body. The chief seat of perception Empedokles held to be the blood, in which the four elements are most evenly mixed, and especially the blood near the heart.[159] This does not, however, exclude the idea that other parts of the body may perceive also; indeed, Empedokles held that all things have their share of thought (v. 195). But the blood was specially sensitive because of its finer mixture. From this it naturally follows that Empedokles adopted the view, already maintained in the Second Part of the poem of Parmenides (v. 146), that our knowledge varies with the varying constitution of our bodies (v. 330 sqq.). This consideration became very important later on as one of the foundations of skepticism; but Empedokles himself simply drew from it the conclusion that we must make the best use we can of our senses, and check one by the other (v. 19 sqq.).

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[157] See Diels, *Emp. u. Gorg.* p. 349. The definition is quoted from Gorgias by Plato, *Meno.* 76 D, where we must read χρημάτων for σχημάτων with the ingenious corrector of Ven. T.

[158] *De An.* B, 7. 418*b*, 20.

[159] R. P. 139*e*. It is an anachronism to say that Emp. said that the "soul" was in the blood. He knew nothing of "souls" except in the form of ghosts, which are corporeal.

Theology and religion.

96. The theoretical theology of Empedokles was expounded in Book III. of his Poem on Nature; his practical religious exhortations, in another work called the *Purifications.* The former reminds us of Xenophanes, the latter of Pythagoras and the Orphics. There is no contradiction here. A polemic against the anthropomorphic polytheism of the poets was quite consistent with a return to religious ideas of a more primitive type. For we must separate clearly these two things, the theology and the religion of Empedokles. The latter stands in no direct connexion with the cosmology, and is probably in the main Orphic; the theology, on the other hand, formed a part of the Poem on Nature, and must surely have a close relation to it.

To begin with the purely theoretical theology. We are told in the earlier part of the poem that certain "gods" are composed of the elements; and that therefore though they "live long lives" they must pass away (v. 107). These perishable gods are, no doubt, the same as the "dæmons" whom we shall have to consider presently. We have seen that the elements and the Sphere are also called gods, and in Book III. (v. 344 sqq.) we suddenly come upon a deity who is described, as Zeller justly remarks, almost in the words of Xenophanes. He holds quite rightly that these verses do not imply monotheism; and we may add that in this respect they are just like the similar utterances of Xenophanes. Surely, then, we may infer that here Empedokles is really speaking of the Sphere, just as Xenophanes was speaking of the World when he described the divine nature, especially as Hippolytos distinctly states that this was so.[160]

If we turn now to the practical religious preaching of the *Purifications*, we find that everything turns on the doctrine of so-called metempsychosis. On the general significance of this doctrine enough has been said above (§ 38); the details given by Empedokles are peculiar. According to a decree of Necessity, "dæmons" who have sinned are forced to wander from their home in heaven for three times ten thousand seasons (v. 369 sqq.). He himself is such an exiled divinity, and has fallen from his high estate to become the slave of raving Strife (v. 382). The four elements toss him from one to the other with loathing (v. 377 sqq.); and so he has not only been a human being and a plant, but even a fish (v. 381). The only way to purify oneself from the taint of original sin was by the cultivation of ceremonial holiness, by purifications, and abstinence from animal flesh. For the animals are our kinsmen (v. 430), and it is parricide to lay hands on them. In all this there are undoubtedly certain points of contact with the cosmology. We have the "mighty oath" (v. 370, cf. v. 141), the four elements (v. 377 sqq.), Hate as the source of original sin (v. 382), and Kypris as queen in the Golden Age (v. 407). But these points are neither fundamental nor of great importance. And, as Zeller rightly points out, there are really contradictions between the two poems. Still, these are not quite so insuperable as he thinks. It is quite true that the permanence of a spiritual soul, an individual personality, is quite irreconcilable with the physical theory we have been studying (§ 94); but Empedokles says nothing whatever about "souls." All he needs would be amply provided for by the reappearance of the same corporeal elements in different combinations; and this, indeed, seems to be hinted at in v. 395. Empedokles had also laid down in his cosmological poem that the gods were made of the four elements, and therefore mortal (v. 107); so there is no difficulty here. We may conclude, I think, that Zeller has been prejudiced by his own use of the misleading word *Seelenwanderung* to describe the doctrine of Empedokles. Nor is there any difficulty about the Golden Age, if we adopt the view taken above as to the four periods. It is to be referred to the time when Hate was just beginning to separate the elements, and before it got decidedly the upper hand. I do not mean for a moment that the religious teaching of Empedokles is to be deduced from his cosmology, or even that the two can be completely reconciled; I only mean that they are so nearly in harmony that Empedokles need never have noticed their divergence.

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[160] *Ref.* vii. 31 (R. P. 140*c*). So Arist. *Met.* B, 4. 1000*b*, 3, calls the sphere *τὸν εὐδαιμονέστατον θεόν*. It is very noteworthy, too, that Hippolytos adds after v. 349 the words, *ἀλλὰ σφαῖρος ἔην καὶ ἴσος ἐστὶν αὐτῷ*, which seems to be a corrupted verse from the original.

CHAPTER VI.

ANAXAGORAS OF KLAZOMENAI.

Date and early life.

97. ALL that Apollodoros tells us with regard to the date of Anaxagoras seems to rest upon the authority of Demetrios Phalereus, who said of him, in the *Register of Archons*, that he began to study philosophy, at the age of twenty, in the archonship of Kallias or Kalliades at Athens (480 B.C.).[1] This date was most probably derived from a calculation based upon the philosopher's age at the time of his trial, which Demetrios had every opportunity of learning from sources now no longer extant. Apollodoros inferred that Anaxagoras was born in Ol. LXX. (500–497 B.C.), and he adds that he died in Ol. LXXXVIII. 1 (428 B.C.). He doubtless thought it natural that he should not survive Perikles, and still more natural that he should die the same year as Plato was born.[2] Besides all this, we have a further statement, of doubtful origin, but probably due to Demetrios also, that Anaxagoras lived at Athens for thirty years altogether. This looks like a genuine tradition;[3] and

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[1] D. L. ii. 7 (R. P. 117 B), with the perfectly certain correction referred to R. P. 117*b*. The Athens of 480 B.C. would hardly be a place to "begin philosophising"!

[2] For the statements of Apollodorus see D. L. ii. 7 (R. P. 117 B); and for the date of Plato's birth, D. L. iii. 1 (R. P. 239).

[3] D. L. *loc. cit.* In any case the statement is no mere calculation of Apollodoros'; for he would certainly have made Anaxagoras forty years

if we accept it, we get from about 462 to 432 B.C. as the period of his residence in that city.

There can be no doubt that these dates are very nearly right. Aristotle tells us[4] that Anaxagoras was older than Empedokles, who was born about 490 B.C. (§ 81); and Theophrastos said[5] that Empedokles was born "not long after Anaxagoras." Demokritos, too, seems to have said that he himself was a young man in the old age of Anaxagoras, and he must have been born about 460 B.C.[6] We shall find further confirmation of all this when we come to consider the date of the trial.

Anaxagoras was born at Klazomenai, and Theophrastos tells us that his father's name was Hegesiboulos.[7] The names of both father and son have a decidedly aristocratic sound, and we may therefore assume that they belonged to a family which had won distinction in the State. Nor need we reject the tradition that Anaxagoras neglected his possessions to follow science.[8] It is certain, at any rate, that in the fourth century he was already regarded as the type of the man who leads the "theoretic life;"[9] and there must have been some ground for this view. Of course the story of his contempt for worldly goods was seized upon later by the historical novelist, and

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old at the date of his arrival in Athens, and this would allow twenty-eight years *at most* for his residence there. The trial cannot have been later than 432 B.C., and may have been earlier.

[4] *Met.* A, 3. 984*a*, 11 (R. P. 119*a*).

[5] *Phys. Op.* fr. 3 (*Dox.* p. 477), ap. Simpl. *Phys.* 19 D (R. P. 129*e*).

[6] D. L. ix. 41 (R. P. 144 B). On the date of Demokritos, see Chap. IX. *n.* 15.

[7] *Phys. Op.* fr. 3 (*Dox.* p. 478), repeated by the doxographers.

[8] [Plato] *Hipp. Maj.* 283 A: τοὐναντίον γὰρ Ἀναξαγόρᾳ φασὶ συμβῆναι ἢ ὑμῖν· καταλειφθέντων γὰρ αὐτῷ πολλῶν χρημάτων καταμελῆσαι καὶ ἀπολέσαι πάντα· οὕτως αὐτὸν ἀνόητα σοφίζεσθαι. Cf. Plut. *Per.* 16.

[9] Arist. *Eth. Nik.* K, 8. 1179*a*, 13. Cf. *Eth. Eud.* A, 4. 1215*b*, 6 and 15; 1216*a*, 10.

tricked out with the usual apophthegms. These do not concern us here.

One incident belonging to the early manhood of Anaxagoras is recorded, namely, his observation of the huge meteoric stone which fell into the Aigospotamos in 469 B.C.[10] Our authorities tell us that the philosopher predicted this phenomenon, which is plainly absurd. But we shall see reason to believe that it may have occasioned one of his most striking departures from the earlier cosmology, and led to his adoption of the very view for which he was condemned at Athens. At all events, the fall of the stone made a profound impression at the time, and it was still shown to tourists in the days of Pliny.

Relation to the Ionic School.

98. Cicero, Diogenes, Strabo, the pseudo-Galen, Eusebios, and Augustine all speak of Anaxagoras as the pupil of Anaximenes.[11] This is, of course, altogether impossible; Anaximenes most probably died before Anaxagoras was born. But it is not enough to say, with Schaubach and Zeller,[12] that the statement is a mere mistake arising from the fact that the name of Anaxagoras followed that of Anaximenes in the *Successions.*[13] This is true, no doubt; but it is not the

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[10] D. L. ii. 10 (R. P. 118*a*). Pliny, *H. N.* ii. 58, gives the date as Ol. LXXVIII. 2 (467 B.C.); the Marmor Parium points rather to 469. The curious may be referred to the Rev. George Costard's dissertation, entitled, *The Use of Astronomy in History and Chronology exemplified in an Inquiry into the Fall of the Stone into the Ægospotamos, said to have been foretold by Anaxagoras.* London 1764.

[11] Cic. *N. D.* i. 26 (after Philodemos): *Anaxagoras qui accepit ab Anaximene disciplinam* (*i.e.* ἤκουσε); D. L. pr. 14 (R. P. 4), and ii. 6; Strabo, xiv. 3. 36 (R. P. 117 A); Euseb. *P. E.* x. 14, p. 504; Ps.-Galen, *H. Phil.* 3; Aug. *Civ. Dei*, viii. 2.

[12] Zeller, 870, *n.* 2 (Eng. trans. ii. p. 326, *n.* 2). Cf. Schaubach, *Anax. Claz. Fragm.* p. 5.

[13] See *Note on Sources*, C.

whole truth. We have the original source of the doxographical tradition in a fragment of Theophrastos himself, which states that Anaxagoras had been "an associate of the philosophy of Anaximenes."[14] Now this expression has a very distinct meaning if we accept the view as to "schools" of science set forth in the *Introduction*.[15] It means that the old Ionic School survived the destruction of Miletos in 494 B.C., and continued to flourish in the other cities of Asia. It means, further, that it produced no man of distinction after its third great representative, and that "the philosophy of Anaximenes" was still taught by whoever was now at the head of the society. This is important; for, as we shall see (§ 154), Schleiermacher tried to make out that the system of Diogenes of Apollonia came between those of Anaximenes and Anaxagoras, and that his philosophy formed the transition between the two.

In view of this and other similar theories, it may be well to indicate briefly here the conclusions to which we shall come in the next few chapters with regard to the development of philosophy during the first half of the fifth century B.C. We shall find that, while the old Ionic School was still capable of training great men, it was now powerless to keep them. Anaxagoras, as we shall see, went his own way; Melissos (§ 137) and Leukippos (§ 147), though they still retained enough of the old views to bear witness to the original source of their inspiration, were too strongly influenced by the Eleatic dialectic to remain content with the theories of Anaximenes. It was left to second-rate minds like

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[14] *Phys. Op.* fr. 4 (*Dox.* p. 478): Ἀναξαγόρας μὲν γὰρ Ἡγησιβούλου Κλαζομένιος κοινωνήσας τῆς Ἀναξιμένους φιλοσοφίας, κ.τ.λ.

[15] *Introd.* § XII.

Diogenes to champion the orthodox system, while third-rate minds like Hippon of Samos even went back to the cruder theory of Thales. The details of this anticipatory sketch will become clearer as we go on; for the present, it is only necessary to call the reader's attention to the fact that the old Ionic Philosophy now forms a sort of background to our story, just as Orphic and Pythagorean religious ideas have done in the preceding chapters.

Anaxagoras at Athens.

99. Anaxagoras was the first philosopher to take up his abode at Athens. We are not to suppose, however, that he was attracted thither by anything in the character of the Athenians. No doubt Athens at this time had become the political centre of the Hellenic world; but it had not yet produced a single scientific man, nor had any Athenian shown the slightest tendency in the direction of philosophy. On the contrary, the temper of the citizen body was and remained hostile to free inquiry of any kind. The religious views of the Demos were of the narrowest kind, and hardly any people has sinned more heavily against the liberty of science. Sokrates, Anaxagoras, and Aristotle fell victims in different degrees to the bigotry of the populace, though, of course, their offence was political rather than religious. They were condemned, not as heretics, but as innovators in the *state* religion. Still, as a recent historian observes, "Athens in its flourishing period was far from being a place for free inquiry to thrive unchecked."[16] It is this, no doubt, which has been in the minds of the numerous writers who have represented philosophy as something un-Greek. It was in reality thoroughly Greek,

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[16] Holm, *Gr. Gesch.* ii. 334. The whole chapter is well worth reading in this connexion.

though it was thoroughly un-Athenian. For the famous speech of Perikles depicts the Athenians, not as they were, but as they should have been; and we must not forget Nikias and Anytos, Strepsiades and Dikaiarchos, Lampon and Diopeithes, when we speak of the Athenian spirit. We might as well forget M. Homais when we generalise about the French.

It seems most reasonable to suppose that Perikles himself brought Anaxagoras to Athens, just as he brought everything else he could. Holm has shown with much skill how the aim of that great statesman was, so to say, to Ionise his fellow-citizens, to impart to them something of the flexibility and openness of mind which characterised their kinsmen across the sea. In this endeavour he was ably seconded by his wife, Aspasia of Miletos, who therefore became the standing butt for the ribaldry of those scurrilous poets who were willing to pander to orthodoxy and obscurantism. She may very well have introduced the Ionian philosopher to the Periklean circle, of which he was henceforth a chief ornament. The Athenians in derision gave him the nickname of Nous.[17]

Be this as it may, the close relation in which Anaxagoras stood to Perikles is placed beyond the reach of doubt by the testimony of Plato. In the *Phaidros*[18] he makes Sokrates say: "For all arts that are great, there is need of talk and discussion on the parts of natural science that deal with things on high; for that seems to be the source which inspires high-mindedness and effectiveness in every direction. Perikles added this very acquirement to his original gifts. He fell in, it seems, with Anaxagoras, who was a scientific man; and, satiating himself with the theory of things on high, and having attained to a knowledge of the true nature of intellect and folly, which were just what the discourses of Anaxagoras were mainly about, he drew from that source whatever was calculated to further him in the art of speech."

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[17] Plut. *Per.* 4 (R. P. 117*b*). I follow Zeller, 871, *n.* 4 (Eng. trans. ii. 327, *n.* 4), in regarding the sobriquet as derisive.

[18] 270 A (R. P. 117*b*). Cf. Plut. *Per.* 4 (R. P. *ib.*).

A more difficult question is the alleged relation of Euripides to Anaxagoras. The oldest authority for it is Alexander of Aitolia, poet and librarian, who lived at the court of Ptolemy Philadelphos (*c.* 280 B.C.). He referred to Euripides as the "nursling of the ancient Anaxagoras."[19] A great deal of ingenuity has been expended in trying to find the system of Anaxagoras in the choruses of Euripides; but, it must now be admitted, without result. The system of the poet, so far as he had one, was quite different, something more like orthodox Ionicism.[20] The famous fragment on the blessedness of the scientific life might just as well refer to any other cosmologist as to Anaxagoras, and indeed suggests far more naturally a thinker of a more primitive type.[21] On the other hand, there is also a fragment which distinctly expounds the central thought of Anaxagoras, and could hardly be referred to any one else.[22] We may conclude, then, that Euripides knew the philosopher and his views, but preferred a system more nearly resembling that of Diogenes.

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[19] Ap. Gell. *N. A.* xv. 20. The statement is repeated by D. L. ii. 101, and many later writers.

[20] See v. Wilamowitz-Möllendorf, *Analecta Euripidea*, p. 162 sqq. Valckenaer (*Diatr. de Eur. p. dr. rel.* p. 26) first raised this question.

[21] The fr. is quoted R. P. 117*c*. The words ἀθανάτου φύσεως and κόσμον ἀγήρω carry us back rather to the older Milesians. Note the propriety with which Euripides uses the words ἱστορία and κόσμος ("order," not "world").

[22] R. P. 119*b*.

The trial.

100. We now come to the sorrowful ending of Anaxagoras' residence at Athens. Shortly before the outbreak of the Peloponnesian War, the enemies of Perikles began a series of attacks upon him through his friends.[23] Pheidias was the first to suffer, and Anaxagoras was the next. That he was an object of special hatred to the religious party need not surprise us, even though the charge made against him does not suggest that he went out of his way to hurt their susceptibilities. The details of the trial are somewhat obscure, but we can make out a few points quite clearly. The first step taken was the introduction of a psephism by Diopeithes, the same whom Aristophanes laughs at in *The Birds*,[24] enacting that an impeachment should be brought against those who did not practise religion, and taught theories about "the things on high."[25] What happened at the actual trial is very differently related. Sotion in his *Successions*, Satyros in his *Lives*, Hermippos, and Hieronymos, gave hopelessly conflicting accounts.[26] It is no use attempting to reconcile these, as some writers have tried to do; nor is it very hopeful to adopt the theologians' device of assuming two trials, though this is actually done by Bayle. It is enough to insist upon what is certain. Now we know positively from Plato what the accusation

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[23] Both Ephoros (represented by Diod. xii. 38) and the source of Plut. *Per.* 32, made these attacks immediately precede the war. This may, however, be pragmatic; they perhaps occurred earlier.

[24] *Birds*, 988. Aristophanes had no respect for orthodoxy when combined with democratic opinions.

[25] Plut. *Per.* 32 (R. P. 117 C). For the procedure, see the article "Eisangelia" in *Dict. Ant.*

[26] These accounts are repeated by D. L. ii. 12–14. It is worth while

was.[27] It was that Anaxagoras taught the sun was a red-hot stone, and the moon earth; and we shall see that he certainly did hold these views (§ 111). For the rest, the most plausible view is that Anaxagoras was got out of prison and sent away by Perikles.[28] We know from Plato's *Kriton* that such things were possible at Athens.

Driven from his adopted home, Anaxagoras naturally went back to Ionia, where at least he would be free to teach what he pleased. He settled at Lampsakos, a colony of Miletos, and we shall see reason to believe that he founded a school there.[29] Probably he did not live long after his exile. The Lampsakenes behaved very differently from the Athenians. They erected an altar to his memory in their market-place, dedicated to Mind and Truth; and the anniversary of his death was long kept as a holiday, it was said at his own request.[30]

Writings.

101. Diogenes expressly includes Anaxagoras in his

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to put the statements of Satyros and Sotion side by side in order to show the unsatisfactory character of the biographical tradition:—

	Sotion.	*Satyros.*
Accuser.	Kleon.	Thoukydides s. of Melesias.
Charge.	Calling the sun a red-hot mass.	Impiety and Medism (!).
Sentence.	Fined five talents.	Sentenced to death in absence.

Hermippos represents Anaxagoras as already in prison under sentence of death when Perikles shamed the people into letting him off. Lastly, Hieronymos says he never was condemned at all. Perikles brought him into court thin and wasted by disease, and the judges acquitted him out of compassion! The Medism alleged by Satyros no doubt comes from Stesimbrotos, who made Anaxagoras the friend of Themistokles instead of Perikles. This, too, explains the accuser's name (Busolt, *Gr. Gesch.* p. 306, n. 3).

[27] *Apol.* 26 D.

[28] Plut. *Nik.* 23 (R. P. 117c). Cf. *Per.* 32 (R. P. 117 D).

[29] Chap. IX. § 159.

[30] The oldest authority for the honours paid to Anaxagoras is Alkidamas, the pupil of Gorgias, who said these were still kept up in his own time. Arist. *Rhet.* B, 23. 1398*b*, 15. Cf. Aelian, *V. H.* viii. 19.

list of philosophers who left only a single book, and he has also preserved the accepted criticism of it, namely, that it was written "in a lofty and agreeable style."[31] There is no evidence of any weight to set against this explicit testimony, which comes ultimately from the librarians of Alexandria.[32] The story that Anaxagoras wrote a treatise on perspective as applied to scene-painting is most improbable;[33] and the statement that he composed a mathematical work dealing with the quadrature of the circle is due to a mere misunderstanding of an expression in Plutarch.[34] We learn from the passage in the *Apology*, referred to above, that the works of Anaxagoras could be bought at Athens for a single drachma; and that the book was of some length may be gathered from the way in which Plato goes on to speak of it.[35] In the sixth century A.D. Simplicius was still able to procure a copy;[36] and it is to him we owe the preservation of all our fragments, with one or two very doubtful exceptions. Unfortunately his quotations seem to be altogether confined to the First Book, that dealing with general principles, so that we are left

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[31] D. L. i. 16; ii. 6 (R. P. 5 B; 122 A).

[32] Schaubach (*An. Claz. Fragm.* p. 57) fabricated a work entitled τὰ πρὸς Λεχίνεον out of the pseudo-Aristotelian *De plantis*, 817*a*, 27. But the Latin version of Alfred, which is the original of the Greek, has simply *et ideo dicit lechineon;* and this appears to be due to a failure to make out the Arabic text from which the Latin version was derived. Cf. Meyer, *Gesch. d. Bot.* i. 60.

[33] It comes from Vitruvius, vii. pr. 11. A forger, seeking to decorate his production with a great name, would think naturally of the philosopher who was said to have taught Euripides.

[34] Plut. *De Exilio*, 607 F. The words merely mean that he used to draw mathematical figures relating to the quadrature of the circle on the prison floor.

[35] *Apol.* 26 D–E. The expression βιβλία perhaps implies that it filled more than one roll.

[36] Simpl. also speaks of βιβλία.

[illegible]

[illegible]

[illegible] R. P. 120.

(2) [illegible] the mass that [illegible] the world, and the [illegible] mass is infinite in quantity. R. P. ib.

(3) (10) And since these things are so, we must suppose that there are contained many things and of all sorts in all the worlds that are brought together, germs of all things, with all sorts of shapes, and colours, and savours (R. P. ib.),[39] and that men have been formed in them, and the other animals that have life, and that these men have inhabited cities and cultivated fields, as with us; and that they have a sun and moon and the rest, as with us; and that their earth brings forth for them many things of all kinds, of which they gather together the best and use them for their dwellings (R. P. 127*b*). Thus much have I said with regard to separating off, that it will not be only with us that things are separated off, but elsewhere too.[40]

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[37] Simplicius tells us (R. P. 120) that this fragment was at the beginning of the First Book. The familiar sentence, quoted by D. L. ii. 6 (R. P. 122 A) and others, is not Anaxagoras' at all, but a summary of his doctrine, due probably to Theophrastus.

[38] Fr. 2 occurred "shortly after" fr. 1 (Simpl. *loc. cit.*).

[39] Fr. 3 also occurred "shortly after" (Simpl. *loc. cit.*). For my insertion of "the worlds," see below, § 110.

[40] I have made fr. 10 continuous with fr. 3, because this is done, not

(11.) . . . as these thus revolve and are separated off by the force and speed. And the speed makes the force. And their speed is like nothing in speed of the things that are now among men, but in every way many times as quick.[41]

. . . .

(4.) But before they were separated off, when all things were together, not even was any colour distinguishable; for the mixture of all things prevented it,—of the moist and of the dry, and the warm and the cold, and the light and the dark [and much earth being in it],[42] and of a multitude of innumerable germs in no way like each other. For none of the other things either is like any other. R. P. 120.

(5.) In everything there is a portion of everything except Nous, and there are some things in which there is Nous also. R. P. 127*b*.

(6.) All other things partake in a portion of everything, while Nous is infinite and self-ruled, and is mixed with nothing, but is alone, itself by itself. For if it were not by itself, but were mixed with anything else, it would partake in all things if it were mixed with any; for in everything there is a portion of everything, as has been said by me in what goes before, and the things mixed with it would hinder it, so that it would have power over nothing in the same way that it has now being alone by itself. For it is the thinnest of all things and the purest, and it has all knowledge about everything and the greatest strength; and Nous has power over all things,

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once only, but twice, by Simpl. in his *Commentary on the Physics* (pp. 35 and 157 D), and once also in that on the *De Cœlo* (*f.* 149). The concluding words (ταῦτα μὲν οὖν μοι λέλεκται περὶ τῆς ἀποκρίσιος ὅτι οὐκ ἂν παρ' ἡμῖν μόνον ἀποκριθείη, ἀλλὰ καὶ ἄλλῃ) are not given in R. P., and Schorn supposed they belonged to Simplicius. The Aldine read ἀποκρίσεως; but we now know from the apparatus of Diels that the best MSS. (D E) have preserved the Ionic ἀποκρίσιος, thus leaving no doubt as to the source from which the sentence comes. That fr. 4 is also given immediately after fr. 3 in another place (p. 156 D; R. P. 120) makes no difference, for it is clearly marked off by the parenthetic φησί.

[41] The place of fr. 11 is settled by that of fr. 10. It came "shortly after" (Simpl. *Phys.* p. 35 D).

[42] I can make nothing of the words γῆς πολλῆς ἐνεούσης. We expect τοῦ ἀραιοῦ καὶ τοῦ πυκνοῦ (cf. fr. 6), and perhaps the doubtful words are a gloss upon πυκνοῦ, which has displaced the original text.

both greater and smaller, that have life. And Nous had power over the whole revolution, so that it began to revolve in the beginning. And it began to revolve first from a small beginning; but the revolution now extends over a larger space, and will extend over a larger still.[43] And all the things that are mingled together and separated off and distinguished are all known by Nous. And Nous set in order all things that were to be and that were, and all things that are not now and that are, and this revolution in which now revolve the stars and the sun and the moon, and the air and the æther that are separated off. And this revolution caused the separating off, and the rare is separated off from the dense, the warm from the cold, the light from the dark, and the dry from the moist. And there are many portions in many things. But no thing is altogether separated off nor distinguished from anything else except Nous. And all Nous is alike, both the greater and the smaller; while nothing else is like anything else, but each single thing is and was most manifestly those things of which it has most in it. R. P. 123.

. . . .

(7.) And when Nous began to move things, separating off took place from all that was moved, and so far as Nous set in motion all was separated. And as things were set in motion and separated, the revolution caused them to be separated much more.

(8.) The dense and the moist and the cold and the dark came together where the earth is now, while the rare and the warm and the dry (and the bright) went out towards the further part of the æther.[44] R. P. 124 A.

(9.) From these as they are separated off earth is solidified; for from mists water is separated off, and from water earth. From the earth stones are solidified by the cold, and these rush outwards more than water. R. P. 124 A.

(12.) But Nous has power over all things that are, and it is now where all the other things are, in the mass that surrounds the world, and in the things that have been separated off and that are being separated off.[45]

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[43] Reading ἐπί for ἐπεί.

[44] On the text of this fr. see R. P. 124*a*. I follow Schorn in inserting also καὶ τὸ λαμπρόν from Hippolytos.

(13.) Nor are the things that are in one world divided nor cut off from one another with a hatchet, neither the warm from the cold nor the cold from the warm. R. P. 123*e*.

(14.) And when those things are being thus distinguished, we must know that all of them are neither more nor less; for it is not possible for them to be more than all, and all are always equal. R. P. 120.

(15.) Nor is there a least of what is small, but there is always a smaller; for it is impossible that what *is* should cease to be by being divided.[46] But there is always something greater than what is great, and it is equal to the small in amount, and, compared with itself, each thing is both great and small. R. P. 126*a*.

(16.) And since the portions of the great and of the small are equal in amount, for this reason, too, all things will be in everything; nor is it possible for them to be apart, but all things have a portion of everything. Since it is impossible for there to be a least thing, they cannot be separated, nor come to be by themselves; but they must be now, just as they were in the beginning, all together. And in all things many things are contained, and an equal number both in the greater and in the smaller of the things that are separated off.

(17.) The Hellenes are wrong in using the expressions coming into being and passing away; for nothing comes into being or passes away, but mingling and separation takes place of things that are. So they would be right to call coming into being mixture, and passing away separation. R. P. 119.

Anaxagoras and his predecessors.

103. The system of Anaxagoras, like that of Empedokles, aimed at reconciling the Eleatic doctrine that corporeal substance is unchangeable with the existence

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[45] Fr. 12 is given thus by Simpl. *Phys.* 157 D: ὁ δὲ νοῦς ὅσα ἐστί τε κάρτα καὶ νῦν ἐστιν ἵνα καὶ τὰ ἄλλα πάντα, ἐν τῷ πολλῷ περιέχοντι, καὶ ἐν τοῖς προσκριθεῖσι, καὶ ἐν τοῖς ἀποκεκριμένοις. Diels (*ad loc.*) suggests: ὁ δὲ νοῦς, ὡς ἀεί ποτε, κάρτα καὶ νῦν ἐστιν . . . καὶ ἐν τοῖς ἀποκριθεῖσι καὶ ἐν τοῖς ἀποκρινομένοις. I prefer ὁ δὲ νοῦς ὅσων τ' ἔστι κρατέει, κ.τ.λ.

[46] Observe Zeller's beautiful emendation of this fr., τομῇ for τὸ μή.

of a world which everywhere presents the appearance of coming into being and passing away. The conclusions of Parmenides are frankly accepted and restated. Nothing can be added to all things; for there cannot be more than all, and all is always equal (fr. 14). Nor can anything pass away. What men commonly call coming into being and passing away is really mixture and separation (fr. 17).

This last fragment reads almost like a prose paraphrase of Empedokles (vv. 89–93); and it is in every way probable that Anaxagoras derived his theory of mixture from his younger contemporary, whose poem was most likely published before his own treatise.[47] On the other hand, the refusal of Anaxagoras to admit the existence of entirely disparate and irreducible elements was doubtless due to his early connexion with the Ionic School. He certainly had to maintain a pluralist doctrine of some sort, if he wished to give an account of motion and change; for Parmenides had shown that these could not be reconciled with a materialistic monism. But, on the other hand, everything changes into everything else,[48] and therefore the theory of Empedokles is insufficient. He had altogether separated the warm element, Fire, from the cold element, Water; but Anaxagoras saw that things were not "cut off with a hatchet" (fr. 13) in this way. On the contrary, the true formula must be: *There is a portion of everything in everything* (fr. 5).

"Everything in everything."

104. A part of the argument by which Anaxagoras

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[47] This is doubtless the meaning of the words τοῖς ἔργοις ὕστερος in Arist. *Met.* A, 3. 984*a*, 12 (R. P. 119*a*); though ἔργα certainly does not mean "writings" or *opera omnia*, but simply "achievements." The other possible interpretations are "more advanced in his views" and "inferior in his teaching" (Zeller, p. 917, *n.* 3).

[48] Arist. *Phys.* A, 4. 187*b*, 1 (R. P. 123*a*).

sought to prove this point has been preserved in a corrupt form by Aetios, and Diels has recovered some of the original words from the scholiast on St. Gregory Nazianzene. "We use a simple nourishment," he said, "when we eat the fruit of Demeter or drink water. But how can hair be made of what is not hair, or flesh of what is not flesh?"[49] This is just the sort of question that the early Milesians must have asked, only the physiological interest has now definitely replaced the meteorological. We shall find a similar train of reasoning in Diogenes of Apollonia (fr. 2).

The statement that there is a portion of everything in everything, is not to be understood as referring simply to the original mixture of things before the formation of the worlds (fr. 1). On the contrary, even now "all things are together," and everything, however small and however great, has an equal number of "portions" (fr. 16). A smaller particle of matter could only contain a smaller number of portions, if one of those portions ceased to be; but if anything *is*, in the full Parmenidean sense, it is impossible that mere division should make it cease to be (fr. 15). Matter is infinitely divisible; for there is no least thing, any more than there is a greatest. But however great or small a body may be, it contains just the same number of "portions," that is, a portion of everything.

The portions.

105. What are these "things" of which everything contains a portion? It is usual to represent the theory of Anaxagoras as if he had said that wheat, for instance, contained small particles of flesh, blood, bones, and the like; but we have just seen that matter is infinitely

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[49] Aet. i. 3. 5 (*Dox.* p. 279). See R. P. 123*f* and *n.* 1. I read καρπὸν with Usener.

divisible, and (fr. 16) that there are as many "portions" in the smallest particle as in the greatest. This is fatal to the common view. If everything was made up of minute particles of everything else, we could certainly arrive at a point where everything was "unmixed," if only we carried division far enough.

We owe the solution of this difficulty to the acumen of M. Tannery.[50] In fr. 13 the examples given of things which are not "cut off from one another with a hatchet" are the hot and the cold; and, in other places (fr. 4, 8), mention is made of the other traditional "opposites" of the Milesian School. Aristotle says that, if we suppose the first principles to be infinite, they may either be one in kind, as with Demokritos, or opposite.[51] Simplicius, following Porphyry and Themistios, refers the latter view to Anaxagoras;[52] and Aristotle himself implies that the opposites of Anaxagoras had as much right to be called first principles as the "homoeomeries."[53]

It is of those opposites, then, and not of the different forms of matter, that everything contains a portion. Every particle of matter, however large or however small it may be, contains every one of those opposite qualities. That which is hot is also to a certain extent cold. Even snow, Anaxagoras affirmed, was black;[54] that is, even the white contains a certain portion of the opposite quality. It is enough to indicate the connexion of this with the views of Herakleitos (§ 63).

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[50] *Science hellène*, p. 283 sqq.

[51] *Phys.* A, 2. 184*b*, 21. The uncertainty of the text does not affect our inference from it.

[52] *Phys.* 44 D. It should be noted, however, that Alexander rejected this interpretation.

[53] *Phys.* A, 4. 187*a*, 25.

[54] Sext. *Pyrrh.* i. 33 (R. P. 128*b*).

Had Anaxagoras possessed the conception of quality, all this could have been made much clearer. It is only obscure because he is obliged to call the primary opposites "things." We have seen already (§ 14) how this came about.

Seeds.

106. These "things" or qualities, though each is present in everything, may be combined in very different proportions, and thus it is that the seeds or germs, or, as we should say, *molecules* of different substances, are distinguished. Each "seed" contains all "things" (or qualities), but each is most obviously of that quality which predominates in it (fr. 6). The seeds of fire contain portions of cold, but the portions of heat so far prevail that we call it hot.

It is these "seeds" that Aristotle spoke of as *ὁμοιομερῆ*. This word has nothing to do with the system of Anaxagoras himself; it belongs entirely to Aristotle's own biological theory.[55] No doubt Anaxagoras, in conformity with the physiological interest of the time, spoke chiefly of the seeds of flesh, bone, and the like. Such things are called "homoeomerous" in the biological works of Aristotle to distinguish them from the *organs*, and the term means simply that they can be divided into parts which are of the same nature as the whole.[56] The word summed up conveniently the class of things which were regarded as primary combinations of the elementary "things" or opposite qualities, but we cannot infer anything at all from it as to the views of Anaxagoras himself.

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[55] See Bonitz, *Ind. s.v.* The ὁμοιομερῆ are intermediate between the *elements*, of which they are compounded, and the *organs*, which are made up of them. The distinction between ὁμοιομερῆ and ἀνομοιομερῆ corresponds to Bichat's fundamental distinction between *tissues* and *organs*. Cf. Lewes, *Aristotle*, p. 279.

[56] Cf. *Gen. Corr.* A, 1. 314*a*, 18 (R. P. 119*a*). The explanation given by Aetios, i. 3. 5 (R. P. 123*f*), is quite wrong.

"All things together."

107. Aristotle, then, was quite justified in calling the seeds of Anaxagoras *homoeomerous*, because, as a matter of fact, the forms of matter which he regarded as primary combinations of the opposites belonged to the class of things to which Aristotle himself gave that name. The examples he cites[57] are bone, flesh, marrow, and the like, which Empedokles had regarded as compounds (v. 199 sqq.). Fire, Air, Earth, and Water, on the contrary, which Empedokles had made the most primitive of all things, were now regarded as secondary combinations of these seeds.[58] We see here how the physiological interest was growing at the expense of every other.

From all this it follows that, when "all things were together," and when the different seeds of things were mixed together in infinitely small particles (fr. 1), the appearance presented would be that of one of what had hitherto been regarded as the primary substances. As a matter of fact, they did present the appearance of "air and æther"; for the qualities (things) which belong to these prevail in quantity over all other things in the universe, and everything is most obviously that of which it has most in it (fr. 6). Here, then, Anaxagoras attaches himself to Anaximenes. The primary condition of things, before the formation of the worlds, is much the same in both; only, with Anaxagoras, the original mass is no longer the primary substance, but a mixture of innumerable seeds divided into infinitely small parts.

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[57] Cf the quotations in R. P. 119*a*.

[58] *Gen. Corr.* A, 1. 314*a*, 24 (R. P. 125). The word πανσπερμία was used also by Demokritos, who most likely got it from Anaxagoras; it occurs in the pseudo-Hippokratean Περὶ διαίτης, i. Great difficulty has been caused by the apparent inclusion of Water and Fire among the ὁμοιομερῆ in *Met.* A, 3. 984*a*, 11 (R. P. 119*a*). This cannot mean that in the system of Aristotle himself Water and Fire were called ὁμοιομερῆ, for the στοιχεῖα are always carefully distinguished from the ὁμοιομερῆ. Bonitz's proposal to translate "as fire and water were in the system of Empedokles," is not very convincing either. I prefer to regard the words καθάπερ ὕδωρ ἢ πῦρ as a (perfectly correct) gloss upon οὕτω. In the next clause I read ἁπλῶς for ἄλλως with Zeller. Cf. also *De Cælo*, Γ, 3. 302*b*, 1 (R. P. 119*a*).

This mass is infinite, like the air of Anaximenes, and it supports itself, since there is nothing surrounding it.[59] Further, the "seeds" of all things which it contains are infinite in number (fr. 1). But, as the innumerable seeds may be divided into those in which the portions of cold, moist, dense, and dark prevail, and those which have most of the warm, dry, rare, and light in them, we may say that the original mass was a mixture of infinite Air and of infinite Fire. The seeds of Air, of course, contain "portions" of the "things" that predominate in Fire, and *vice versa;* but we regard everything as being that of which it has most in it. Lastly, there is no void in this mixture, an addition to the theory made necessary by the arguments of Parmenides. It is, however, worthy of note that Anaxagoras added an experimental proof of this to the purely dialectical one of the Eleatics. Aristotle, indeed, laughs at his torturing of bladders and shutting up of air in water-clocks, and quite correctly observes that these experiments proved no more than that air was something, a corporeal substance.[60] But this was really very much to the point; for, as has been noted more than once, what Aristotle called Air, had been regularly identified with empty space until the days of Empedokles and Anaxagoras.[61]

108. Like Empedokles, Anaxagoras required some **Nous.**

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[59] Arist. *Phys.* Γ, 5. 205*b*, 1 (R. P. 122*c*).
[60] *Phys.* Z, 6. 213*a*, 22 (R. P. 126).
[61] Chap. II. § 42.

external cause to produce motion in the mixture. Body, Parmenides had shown, would never move itself, as the Milesians had supposed. This external cause Anaxagoras called by the name of Nous. It was this which made Aristotle say that he "stood out like a sober man from the random talkers that had preceded him,"[62] and he has accordingly been generally credited with the introduction of the suprasensible into philosophy. The disappointment expressed both by Plato and Aristotle as to the way in which Anaxagoras worked out the theory should, however, make us pause to reflect before accepting a too exalted view of it. Plato[63] makes Sokrates say: "I once heard a man reading a book, as he said, of Anaxagoras', and saying that it was Mind that ordered the world and was the cause of all things. I was delighted to hear of this cause, and I thought that he really was right. . . . But my extravagant expectations were all dashed to the ground when I went on and found that the man made no use of Mind at all. He ascribed no causal power whatever to it in the ordering of things, but to airs, and æthers, and waters, and a host of other strange things." Aristotle says:[64] "Anaxagoras uses Mind as a *deus ex machina* to account for the formation of the world; and whenever he is at a loss to explain why anything necessarily is, he drags it in. But in other cases he makes anything rather than Mind the cause." These utterances may well suggest a *prima facie* suspicion that the Nous of Anaxagoras did not really stand on a very much higher level than the Love and Strife of Empedokles, a suspicion which will only be confirmed when we look at what he himself has to say on the point.

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[62] *Met.* A, 3. 984*b*, 8 sqq. (R. P. 121).

[63] *Phaid.* 97 B (R. P. 123*d*). [64] *Met.* A, 4. 985*a*, 18 (R. P. 123*d*).

In the first place, Nous is unmixed (fr. 8), and does not, like other things, contain a portion of everything. This would hardly be worth saying of an immaterial mind; no one would suppose that to be hot or cold. The result of its being unmixed is that it "has power over" everything, that is to say, in the language of Anaxagoras, it causes things to move.[65] Herakleitos had said as much of Fire, and Empedokles of Strife.[66] Further, it is the "thinnest" of all things, so that it can penetrate everywhere, and it would be meaningless to say that the immaterial is "thinner" than the material. It is true that Nous also "knows all things"; but so, perhaps, did the Fire of Herakleitos,[67] and certainly the Air of Diogenes.[68] Zeller holds, indeed, that Anaxagoras meant to speak of something incorporeal; but he fully admits that he did not succeed in doing so,[69] and this is historically the important point. Nous is certainly imagined as occupying space; for we hear of greater and smaller parts of it (fr. 8).

The truth probably is that Anaxagoras substituted Nous, still conceived as a body, for the Love and Strife of Empedokles simply because he wished to retain the old Ionic doctrine of a substance that "knows" all things, and to identify this with the new theory of a substance that "moves" all things. Perhaps, too, it was his increased interest in physiological as distinguished from purely cosmological matters that led him to speak of Mind rather than soul. The former word certainly suggests design more clearly than the latter. But, in any case, the originality of Anaxagoras lies far more in the theory of matter than in that of Nous.

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[65] The word κρατεῖν does not really mean anything more than the old κυβερνᾶν; cf. Arist. *Phys.* Θ, 5. 256*b*, 24. The interpretation given in *De An.* Γ, 4. 429*a*, 18, is unhistorical.

[66] Chap. III. § 56; Chap. V. § 85.

[67] Fr. 1, Byw., if we retain the MS. εἰδέναι. In any case, the phrase τὸ σοφόν implies this view.

[68] Fr. 3, 4, Schorn (R. P. 162, 163).

[69] Zeller, p. 888.

Formation of the worlds.

109. The formation of a world starts with a rotatory motion which Nous imparts to a portion of the mixed mass in which "all things are together" (fr. 7), and this rotatory motion gradually extends over a wider and wider space. Its rapidity (fr. 2) produced a separation of the rare and the dense, the cold and the hot, the dark and the light, the moist and the dry (fr. 6). These are not, of course, the primary opposites called by this name, but "seeds" of things in which one or other of the opposites predominates. This separation produces two great masses, the one consisting of the rare, hot, light, and dry, called the "Æther";[70] the other, in which the opposite qualities predominate, called "Air" (fr. 1). Of these the Æther or Fire took the outside while the Air occupied the centre (fr. 8), according to the invariable view of all cosmologists since Anaximander.

The next stage is the separation of the air into clouds, water, earth, and stones (fr. 9). In this Anaxagoras follows Anaximenes closely. In his account of the origin of the heavenly bodies, however, he showed himself much more original. We read at the end of fr. 9 that stones "rush outwards more than other things," and we learn from the doxographers that the heavenly bodies were explained as stones torn from the earth by the rapidity of its revolution and made red-hot by the speed of their own motion.[71] Perhaps the fall of the meteoric stone at Aigospotamoi had something to do with the origin of this theory. It may also be observed that, while in the earlier stages of the world-formation we are guided chiefly by the analogy of water rotating with light and heavy bodies floating in it, we are here reminded rather of a sling.

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[70] Note that Anaxagoras uses "air" where Empedokles had said "æther" (§ 85). "Æther" with Anaxagoras is equivalent to Fire; cf. Arist. *De Cœlo*, Γ, 3. 302*b*, 4 (R. P. 124*b*), and *ib.* Α, 3. 271*b*, 24: Ἀν. δὲ καταχρῆται τῷ ὀνόματι τούτῳ οὐ καλῶς· ὀνομάζει γὰρ αἰθέρα ἀντὶ πυρός.

Innumerable worlds.

110. That Anaxagoras adopted the ordinary Ionian theory of innumerable worlds is perfectly clear from fr. 3 and 10, which we have no right to separate from each other.[72] The last words of fr. 10, in particular, prove clearly that Nous has caused a rotatory movement in more parts of the boundless mixture than one. The passage of Aetios, upon which we relied with regard to Anaximander, certainly includes Anaxagoras among those who held there was only one world; but this testimony cannot be considered of the same weight as that of the fragments.[73] Zeller's reference of fr. 10 to the moon is very improbable. Is it likely that any one would say that the inhabitants of the moon "have a sun and moon as with us"?[74]

Cosmology.

111. The cosmology of Anaxagoras is clearly based upon that of Anaximenes, as will be obvious from a comparison of the following passage of Hippolytos[75] with the quotations given in Chap. I. (§ 28):—

> (3.) The earth is flat in shape, and remains suspended because of its size and because there is no vacuum.[76] For this reason

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[71] Aet. ii. 13. 3 (*Dox.* p. 341); R. P. 124*e*.

[72] See above, *n.* 40.

[73] Aet. ii. 1. 3. See above, Chap. II. *n.* 80.

[74] Further, it can be proved that the passage occurred quite near the beginning of the work, long before anything can have been said about the moon. Fr. 3 came "shortly after" fr. 2, which came "shortly after" fr. 1, which was the beginning of the book. See above, *notes* 37, 38, 39.

[75] *Ref.* i. 8. 3 sqq. (*Dox.* p. 562).

[76] The second reason, viz. that there is no vacuum, is doubtless an

the air is very strong, and supports the earth which is borne up by it.

(4.) Of the moisture on the surface of the earth, the sea arose from the waters in the earth, . . . and from the rivers which flow into it.[77]

(5.) Rivers take their being both from the rains and from the waters in the earth; for the earth is hollow, and has waters in its cavities. And the Nile rises in summer owing to the water that comes down from the snows in Ethiopia.[78]

(6.) The sun and the moon and all the stars are fiery stones ignited[79] by the rotation of the æther. Under the stars are the sun and moon, and also certain bodies which revolve with them, but are invisible to us.

(7.) We do not feel the heat of the stars because of the greatness of their distance from the earth; and, further, they are not so warm as the sun, because they occupy a colder region. The moon is below the sun, and nearer us.

(8.) The sun surpasses the Peloponnesos in size. The moon has not a light of her own, but gets it from the sun. The course of the stars goes under the earth.

(9.) The moon is eclipsed by the earth screening the sun's light from it, and sometimes, too, by the bodies below the moon coming before it. The sun is eclipsed at the new moon, when the moon screens it from us. Both the sun and the moon turn in their courses owing to the repulsion of the air. The moon turns frequently, because it cannot prevail over the cold.

(10.) Anaxagoras was the first to determine what concerns the eclipses and the illumination of the sun and moon. And he said the moon was of earth, and had plains and ravines in it. The Milky Way was the reflexion of the light of the stars that were not illuminated by the sun. Shooting stars were sparks, as it were, which leapt out owing to the motion of the heavenly vault.

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addition made by An. to the old theory. The Eleatic discovery is here pressed into the service of Milesian views.

[77] The text here is very corrupt, but we may gather the doctrine of Anaxagoras from other sources, *e.g.* Aet. iii. 16. 2.

[78] Reading Αἰθιοπικοῖς for ἄρκτοις from Diod. i. 38 and Aet. iv. 1. 3.

[79] Reading ἐμπυρωθέντας with Usener.

(11.) Winds arose when the air was rarefied by the sun, and when things were burned and made their way to the vault of heaven and were carried off. Thunder and lightning were produced by heat striking upon clouds.

(12.) Earthquakes were caused by the air above striking on that beneath the earth; for the movement of the latter caused the earth which floats on it to rock.

All this confirms in the most striking way the statement of Theophrastos, that Anaxagoras had belonged to the school of Anaximenes. The flat earth floating on the air, the dark bodies below the moon, the explanation of the solstices and the annual course of the sun and moon by the resistance of air, the explanations given of wind and of thunder and lightning, are all derived from the earlier inquirer.[80]

112. "There is a portion of everything in everything except Nous, and there are some things in which there is Nous also" (fr. 5). In these words Anaxagoras laid down the distinction between animate and inanimate things. He tells us that it is the same Nous which "has power over," that is, sets in motion, all things that have life, both the greater and the smaller (fr. 6). There is nothing new in this; since the time of Anaximenes it had been the current doctrine (§ 27). The Nous in living creatures is the same in all (fr. 6), and from this it followed that the different grades of intelligence which we observe in the animal and vegetable worlds depend entirely on the structure of the body. The Nous was the same, but it had more opportunities in one body than another. Man was the wisest of animals, not because he had a better sort of Nous, but simply because he had hands.[81] This view is quite in accordance with the **Biology.**

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[80] See above, Chap. I. § 28.

[81] Arist. *Part. An.* A, 10. 687*a*, 7 (R. P. 127*b*).

previous development of thought upon the subject. Parmenides, in the second part of his poem (v. 146 sqq.), had already made the thought of men depend entirely upon the constitution of their limbs.

As all Nous is the same, we are not surprised to find that plants were regarded as living creatures. If we may trust the pseudo-Aristotelian *Treatise on Plants*[82] so far, Anaxagoras argued that they must feel pleasure and pain in connexion with their growth and with the fall of their leaves. Plutarch says[83] that he called plants "animals fixed in the earth."

Both plants and animals originated in the first instance from the *πανσπερμία*. Plants first arose when the seeds of them which the air contained were brought down by the rain-water,[84] and animals originated in a similar way.[85] Like Anaximander, Anaxagoras held that animals first arose in the moist element.[86]

Perception

113. In these scanty notices, we seem to see traces of a polemical attitude towards Empedokles, and the same may be observed in what we are told of the theory of perception adopted by Anaxagoras. The account which Theophrastos gives of this[87] is as follows:—

(27.) But Anaxagoras says that perception is produced by opposites; for like things cannot be affected by like. He attempts to give a detailed enumeration of the particular senses. We see by means of the image in the pupil; but no image is cast upon what is of the same colour, but only on what is different. With most living creatures things are of a different colour to the pupil by day, though with some this is so by night, and these are accordingly keen-sighted at that time. Speaking generally, however, night is more of the same colour with the eyes than day. And an image is cast on the pupil by day, because light is a concomitant cause of the image, and because the prevailing colour casts an image more readily upon its opposite.

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[82] A, 1. 815*a*, 15 (R. P. 127 D).

[83] *Q. Nat.* 1 (R. P. 127 C).

[84] Theophr. *Hist. Plant.* iii. 1. 4 (R. P. 127 A).

[85] Irenæus, *adv. Hær.* ii. 14. 2 (R. P. 127*a*).

[86] Hipp. *Ref.* i. 8. 12 (*Dox.* p. 563).

[87] *De Sens.* 27 sqq. (*Dox.* p. 507).

(28.) It is in the same way that touch and taste discern their objects. That which is just as warm or just as cold as we are neither warms us nor cools us by its contact; and, in the same way, we do not apprehend the sweet and the sour by means of themselves. We know cold by warm, fresh by salt, and sweet by sour, in virtue of our deficiency in each; for all these are in us to begin with. And we smell and hear in the same manner; the former by means of the accompanying respiration, the latter by the sound penetrating to the brain, for the bone which surrounds this is hollow, and it is upon it that the sound falls.

(29.) And all sensation implies pain, a view which would seem to be the consequence of the first assumption, for all unlike things produce pain by their contact. And this pain is made perceptible by the long continuance or by the excess of a sensation. Brilliant colours and excessive noises produce pain, and we cannot dwell long on the same things. The larger animals are the more sensitive, and, generally, sensation is proportionate to the size of the organs of sense. Those animals which have large, pure and bright eyes see large objects and from a great distance, and contrariwise.

(30.) And it is the same with hearing. Large animals can hear great and distant sounds, while less sounds pass unperceived; small animals perceive small sounds and those near at hand. It is the same too with smell. Rarefied air has more smell; for, when air is heated and rarefied, it smells. A large animal when it breathes draws in the condensed air along with the rarefied, while a small one draws in the rarefied by itself; so the large one perceives more. For smell is better perceived when it is near than when it is far by reason of its being more condensed, while when dispersed it is weak. But, roughly speaking, large animals do not perceive a rarefied smell, nor small animals a condensed one.

This theory marks a notable advance upon that of Empedokles, and it was a happy thought of Anaxagoras to make sensation depend upon irritation by opposites, and to connect it with pain. Many modern theories are based upon a similar idea.

That Anaxagoras regarded the senses as incapable of reaching the truth of things, is shown by the fragments preserved by Sextus. But we must not, for all that, turn him into a skeptic. The saying preserved by Aristotle[88] that "things are as we suppose them to be," has no value at all as evidence. It comes from some collection of apophthegms, not from the treatise of Anaxagoras himself; and it had, as likely as not, a moral application. What we may probably gather from Sextus is that he said "the weakness of our senses prevents our discerning the truth."[89] This meant simply, as the example given shows, that we do not see the "portions" of everything which are in everything, for instance the portions of black which are in the white. Our senses simply show us the portions that prevail (fr. 6).

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[88] *Met.* A, 5. 1009*b*, 25 (R. P. 128*a*).

[89] *Math.* vii. 90 (R. P. 128). That the fragment quoted is genuine, is rendered probable by the Ionic ἀφαυρότητος.

CHAPTER VII.

THE PYTHAGOREANS.

The Pythagorean School.

114. We saw above (§ 36) how the Pythagoreans, after losing their supremacy in Kroton and the other cities of southern Italy, first concentrated themselves at Rhegion. It may have been here that the foundations of what is called the Pythagorean philosophy were laid. On the breaking up of the school at Rhegion, Archytas, we are told, stayed behind in Italy, while Philolaos and Lysis, the latter of whom had escaped when a young man from the massacre at Kroton (§ 36), betook themselves to Hellas, settling finally at Thebes. It would seem that Archytas carried on the political traditions of the Order in his native city of Taras, though it is unlikely that he kept up the superstitions on which its power was originally based. He appears simply as a gifted general and statesman. According to Aristoxenos, he was never beaten in the field.[1] Besides this he was a scientific man, and to him is ascribed the discovery of mathematical mechanics.[2] As to Philolaos, we know from Plato[3] that he was at Thebes some time during the last

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[1] D. L. viii. 79 (R. P. 50 B, *d*). The main facts about Archytas rest upon the authority of Aristoxenos; but unfortunately he has got mixed up with the romance which passes for Plato's life.

[2] D. L. viii. 83 (R. P. 50 B).

[3] *Phaid.* 61 D (R. P. 50*a*). He was "heard" by Simmias and Kebes, who were present at the death of Sokrates in 399 B.C.

quarter of the fifth century, B.C. Lysis was later on the teacher of Epameinondas.[4] The last generation of the school is represented by the friends of Aristoxenos.[5]

Pythagorean writings.

115. Every one now admits that such things as the *Golden Verses*[6] and the treatises that go by the names of Ocellus Lucanus[7] and Timaios Lokros[8] are late forgeries. As to the alleged fragments of Archytas, too, there is now a pretty general agreement.[9] But, as it is still widely believed that the remains of Philolaos are authentic, a more careful examination of the evidence becomes needful.

The earliest express mention of the work from which these fragments come is that of Demetrios Magnes, who wrote in the first century B.C. He had undoubtedly seen the book, for he quotes a few words from the beginning of it.[10] All previous references are of a very peculiar character, as has been well shown by Mr. Bywater.[11] Hermippos, the pupil of Kallimachos, said that he had read in "some writer" that Plato had bought the work from the relatives of Philolaos in Sicily, and had copied his *Timaios* out of it.[12] Satyros, the pupil of Aristarchos, is equally vague. According to him, Plato bought from Philolaos "three Pythagorean books," which are not actually said to have been by Philolaos himself.[13] Still earlier, Timon of Phlious says simply that Plato bought "a little book for a great sum," and learnt "to write Timaios" out of it.[14] There are other references to this story, but they are equally indefinite and inconsistent.[15] Every one has heard of the book, but no one has seen it; and, the further back we go, the less is known about it. As Mr. Bywater says,[16] the history of the work ascribed to Philolaos before the time of Demetrios Magnes "reads like the history, not so much of a book, as of a literary *ignis fatuus* floating before the eyes of imaginative writers." If such a book had ever existed, surely Aristotle would have mentioned the views of Philolaos somewhere.[17] Further, even if there was such a book, it cannot have been the same as that from which our fragments come; for that has no special affinities with the *Timaios*, but rather, if anything, with the *Philebos*.

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[4] Iambl. *V. Pyth.* 250 (after Aristoxenos); R. P. 49*b*. Cf. Diod. x. 11. 2; Neanthes, fr. 18 (F. H. G. iii. 5).

[5] D. L. viii. 15 (R. P. 51).

[6] An attempt has, indeed, been made by v. Wilamowitz-Möllendorff to show that the *Golden Verses* belong to an early date, but it must certainly be pronounced a failure. See Diels, *Arch.* iii. p. 458.

[7] The fragments are given F. P. G. i. 383.

[8] This is a mere extract from Plato's *Timaios* done into Doric. It is generally printed in editions of Plato's works.

[9] The fragments are given in F. P. G. i.—See the literature referred to R. P. 50*d*.

[10] D. L. viii. 85 (R. P. 52*b*). The quotation does not quite agree with any of the fragments given by Stobaios, but it is of similar character.

[11] *On the Fragments attributed to Philolaus the Pythagorean* (*Journ. of Phil.* i. p. 21 sqq.). The genuineness of the fragments was maintained by Boeckh (*Philolaos des Pythagoreer's Lehren nebst den Bruchstücken seines Werkes*, 1819), and impugned by Val. Rose (*Comm. de Arist. libr. ord. et auct.* 1854), who regarded them as a com-

Mr. Bywater has not discussed the origin of this

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paratively early forgery, and C. Schaarschmidt (*Die angebliche Schriftstellerei des Philolaus*, 1864), who relegated them to the first century B.C.

[12] D. L. viii. 7. Note the vagueness of the expression τινὰ τῶν συγγραφίων.

[13] D. L. iii. 11.

[14] Ap. Gell. iii. 17 (R. P. 50*a*).

[15] See D. L. viii. 4. 7.

[16] *Loc. cit.* p. 29. Mr. Bywater compares the supposed book to the notorious *De tribus impostoribus*.

[17] His very name occurs once only in the Aristotelian corpus, viz. *Eth. Eud.* B, 8. 1225*a*, 33, where what we are told seems to be an apophthegm of the usual unauthentic type.

phantom treatise; but to me it seems possible that Aristoxenos was the person in whose fertile brain it first arose. He was always on the outlook for an opportunity to damage Sokrates and Plato, and it is to him we owe the astounding piece of information that the *Republic* was copied from a book by Protagoras.[18] The story about the origin of the *Timaios* certainly sounds like a companion statement to this.

We have now to consider the work from which the actually existing fragments are taken. This certainly existed in the first century B.C., when Demetrios Magnes saw it. It was in three books, and Proclus refers to it by the title of *Bakchai*.[19] Boeckh accepted all the fragments which Stobaios had extracted from it, but no one will now go so far as this. The lengthy extract from the part of the work, entitled *The Soul*, is given up even by Zeller, who maintains the genuineness of the rest.[20] To begin with, it is written in a dialect which may best be described as Cockney Doric, that is to say, Attic of the decadence tricked out with long *alphas* and *omegas*. It even contains terms which we know to have been invented by Aristotle and Plato,[21] so we need not further discuss it. But the other fragments are more important; for, as has been mentioned, Zeller still regards them as authentic. It will be admitted that this view is not *prima facie* probable; for there is no external evidence to show that they are derived from a different source; it would seem reasonable, then, to accept all or reject all, unless the internal evidence were simply overwhelming.

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[18] Ap. D. L. iii. 25.

[19] Boeckh, *op. cit.* p. 24.

[20] The passage is given, R. P. 57, and is discussed by Mr. Bywater, *op. cit.* p. 39 sqq. Cf. Zeller, 261, *n.* 3 (Eng. trans. 314, *n.* 2).

[21] For instance: *τὰν ἀρχὰν τᾶς κινάσιος καὶ μεταβολᾶς, ἐνέργειαν ἀΐδιον θεῶ, ἀεὶ κατὰ τὸ αὐτὸ καὶ ὡσαύτως ἔχων, τῷ γεννάσαντι πατέρι καὶ δημιουργῷ.*

This, however, it is as far as possible from being. Whatever the system expounded in the fragments may be, it is assuredly not that which Aristotle attributes to the Pythagoreans; on the contrary, it is, as was mentioned above, much more like the theory of Plato's *Philebos*. And it is hardly correct to say that there are no traces in these fragments of later language and thought; there are really a considerable number.[22] But the most convincing proof of late origin is the simple experiment of stripping off the Doric forms. We find then that what we have left is nothing else than the philosophic prose invented by Aristotle.

The problem.

116. It will now be clear that our only chance of discovering what Pythagoreanism really was will depend upon the use of other sources than the supposed fragments of Philolaos. These sources are, however, of very different value. Zeller has done much to clear the way for an intelligible account of the Pythagorean philosophy by stripping it of the more recent accretions which have attached themselves to it. These are mainly of two kinds. We have, first of all, the Platonic elements which forced their way into the system at the time when the Academy under Speusippos was drawing closer and closer to the Pythagoreans. The opposition of the "monad" and the "indeterminate dyad" belongs to this class.[23]

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[22] For instance ἀρχή, in the Aristotelian sense, fr. 4 (R. P. 56), εἴδεα, fr. 3 (R. P. 53), the five Platonic elements, fr. 20 (R. P. 67*a*). For more, see Mr. Bywater, *op. cit.* We may note also that the numbers are not said to *be* things in the way Aristotle describes. We hear of an unknowable underlying ἐστώ (R. P. 56), which is simply the Aristotelian ὕλη. Things merely *have* number, and this makes them knowable, hardly an early idea or possible before the rise of quantitative science. In any case, the unknowable substance of fr. 4 cannot be the same as the numbers, which are pre-eminently knowable (fr. 3).

[23] Zeller, p. 330 sqq. (Eng. trans. p. 386 sqq., where in l. 12 read "the odd and the even" for "the crooked and the straight"). Aristotle says

Secondly, we have the fantastic theology of the Neopythagoreans, where the opposition of the Limit and the Unlimited appears as one between God and Matter.[24] It remains to be seen, however, whether we are not entitled to go rather farther in this direction than Zeller himself has done. The system, even as he describes it, seems too remote from the rest of the early philosophy. In the words of a recent writer, "the pre-Sokratic philosophy is like a dialogue which the Pythagoreans interrupt without knowing what is the subject under discussion."[25]

The Numbers.

117. As is well known, the fundamental doctrine of the Pythagoreans was that things are *Numbers*. This has led many to speak of their philosophy as holding a middle place between the purely physical systems of the Ionians and the metaphysical theories of the Eleatics. We have seen already (Chap. IV.) that the Eleatics intended their system to be a physical one just as much as the Ionians did; we have now to show that Pythagoreanism too was, like all early Greek philosophy, an attempt to explain the sensible world from a sensible origin, and not an idealistic, or even a semi-idealistic hypothesis. Aristotle has been at the pains to warn us against this very misconception. He tells us that, "though the Pythagoreans made use of less obvious first principles and elements than the rest, seeing they did not derive these from

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distinctly *Met.* A, 6. 987*b*, 25) that "to set up a dyad instead of the Unlimited regarded as one, and to make the Unlimited consist of the Great and Small, is distinctive of Plato." (R. P. 60*a*.) Zeller surely makes an unnecessary concession with regard to this passage (Zeller, p. 339, *n*. 1; Eng. trans. p. 396, *n*. 1).

[24] Zeller, p. 340 sqq. (Eng. trans. p. 397 sqq.).

[25] Joel, *Zur Gesch. der Zahlprinzipien in der Gr. Phil.* (*Zschr. f. Phil.* N. F. 97, p. 184). The best account of Pythagoreanism known to me is that of Bäumker, *Das Problem der Materie*, p. 33 sqq. I have made free use of this.

sensible objects," their discussions were nevertheless concerned with nature alone. They described the origin of the heavens, and observed its parts and phenomena, "agreeing, apparently, with the other cosmologists in holding that reality is just what can be perceived by the senses, and is contained within the compass of the heavens."[26] It is clear from the way in which Aristotle goes on to speak of this in the same passage that he was very much puzzled by it. Though they confined themselves to the sensible, the first causes which they assumed were quite adequate to explain realities of a higher kind, and were even more applicable to these than to natural phenomena.[27] And certainly if the Pythagoreans had meant by "numbers" what Aristotle himself meant, his surprise would be sufficiently justified; but we must not assume, without proof, that they did mean this. It is *prima facie* unlikely that the idea of abstract numbers existed at all at this date; and it is still more unlikely that, if it did, the Pythagoreans should have been so completely emancipated from the naive realism of their times as to assert that the world was made of abstractions.

The Numbers not abstract.

118. Let us look at this last point more closely. According to Aristotle,[28] the Pythagoreans held that the elements of number were the elements of things, and, therefore, that things were numbers. To us, accustomed as we are from childhood to the multiplication table, such an assertion seems simply meaningless. We are so familiar with the idea of counting without counting

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[26] *Met.* A, 8. 989*b*, 29 sqq. (R. P. 76*a*). I read ἐκτοπωτέροις for ἐκτοπωτέρως with Alexander and Bonitz. Cf. also N, 3. 1091*a*, 18: *κοσμοποιοῦσι καὶ φυσικῶς βούλονται λέγειν.*

[27] *Met. ib.* 990*a*, 5.

[28] *Met.* A, 5. 986*a*, 1. Note that a little lower down he refers the numbers to the material cause (986*a*, 15).

anything, that it is only by an effort we can realise what a very abstract process this is.[29] It is certain, however, that, natural as it may be to us to speak of numbers as things that can exist by themselves, it was long before men learnt to think of a number, except as a number of something.

Our suspicion that the Pythagorean numbers were not what we should call by that name, that is to say, abstract numbers, is abundantly confirmed by Aristotle. They were, he tells us, intended to be mathematical numbers, but they were not "separated from the objects of sense."[30] They could not really be mathematical numbers, since bodies were made up of them.[31] Lastly, there is no doubt that the Pythagoreans said that the real world was made of numbers.[32]

This explains another of Aristotle's statements. The Pythagoreans are several times classed with Plato as holding that the elements of numbers have an independent reality of their own, and are not mere predicates of something else.[33] At first sight this might seem to be a contradiction of Aristotle's other assertion that the numbers were not separated from the objects of sense; and certainly, if he did not go on to point out the difference between the Pythagoreans and Plato, it would be so. He is, however, very careful to mark this difference. Plato agreed with the Pythagoreans, he says,[34] in holding that unity, for instance, was a reality; but he differed from them in believing that it was separable from the objects of sense. In short, we may say that, whereas the Pythagoreans maintained that numbers were realities because they had not yet learnt to distinguish them from that of which they were numbers, Plato, who did so distinguish them, could yet affirm their reality because he held there were other kinds of reality than that of sensible objects.

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[29] Even in this case it is, no doubt, truer to say that we count the places in the numerical series, which represent in an abstract form all possible contents. See Bosanquet, *Logic*, i. p. 167.

[30] *Met.* M, 6. 1080*b*, 16; N, 3. 1090*a*, 20.

[31] "That bodies should be composed of numbers, and that that number should be mathematical, is impossible," *Met.* M, 8. 1083*b*, 11. "By making natural bodies out of numbers, things that have lightness and weight out of what has neither weight nor lightness, they appear to be talking of another world (οὐρανός) and other bodies, not of those that are objects of sense," *ib.* N, 3. 1090*a*, 32.

[32] "There is no other number but that of which the world is composed." *Met.* A, 8. 989*b*, 21. "They construct the whole heavens out of numbers," *ib.* M, 6. 1080*b*, 18; *De Cœlo*, Γ, 1. 300*a*, 15. "The whole heavens are a harmony and a number," *Met.* A, 5. 986*a*, 2.

[33] "They did not think that the limit and the unlimited and the one were certain other substances (φύσεις), as Fire or Water, or something else of that nature; but that the unlimited itself and the one itself

The elements of number. (a) Limit and the Unlimited.

119. What, then, are these numbers which can be so easily identified with things? We shall be better able to answer this question if we consider, first, the "elements of number," which, as Aristotle tells us, were the same as the elements of things. These were the Odd and the Even, identified with the Limit and the Unlimited respectively. Now Aristotle clearly indicates that the Unlimited of the Pythagoreans differed from that of Plato in being spatial. His argument against it in the *Physics* is based entirely on this assumption. If, he says, the Unlimited is itself a reality, and not merely the predicate of some other reality, every part of

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were the real essence of the things of which they are predicated, and that is why they said that number was the real essence of everything," *Met.* A, 5. 987*a*, 19. "Some, like the Pythagoreans and Plato, make the unlimited in itself a reality, not as an attribute of something else," *Phys.* Γ, 1. 203*a*, 4.

[34] "Plato makes the numbers something beside the objects of perception, while they say the numbers are the things themselves," *Met.* A, 6, 987*b*, 27, and often.

it must be unlimited also, just as every part of air is air.[35] The same is implied in the statements that the Unlimited extends outside the heavens, and that, in the formation of the world, the Unlimited was limited by the central Fire (§ 125). The Pythagorean Unlimited is, in fact, the *res extensa*; it is an early attempt to conceive Space in a realistic way, and not merely as the place of body. Being an early attempt, it was not very successful; and, if the Pythagoreans did not make the Unlimited a mere predicate of Air like Anaximenes (§§ 24–26), they fell into the opposite extreme of simply identifying it with Air and the Void. So, at least, we are told by Aristotle, though there is no trace of this in the supposed fragments of Philolaos.[36]

The Limit must, of course, be strictly correlative to the Unlimited. It will then be a spatial limit, and not an ideal one.

The elements of number. (*b*) The Odd and Even.

120. This distinction between the Limit and the Unlimited was held by the Pythagoreans to be identical with that between Odd and Even. The reasons which have been assigned for this identification, which does not seem to be of much importance to the system, are contradictory and in part unintelligible.[37] If, however, we keep closely to our only trustworthy authority, Aristotle, it will perhaps be possible to make out what

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[35] *Phys.* Γ, 4. 204*a*, 20 sqq. Aristotle nowhere objects to the unlimited of Plato on grounds of this sort.

[36] "The Pythagoreans say that there is empty space, and that it enters into the world (*οὐρανός*), which is regarded as breathing, from the infinite breath outside," *Phys.* Δ, 6. 213*b*, 23 (R. P. 63*c*). In "Philolaos," however, air is one of the five elements (fr. 20, R. P. 67 A). This space or air διορίζει τὰς φύσεις, *i.e.* keeps substances apart, gives them extension.

[37] The commentators usually say that even numbers were called unlimited because they could be halved indefinitely, which, as Simplicius points out in *Phys.* p. 455, 20 D., is not the case.

was meant. In the *Physics* we are told, according to the most probable interpretation, that it is the inclusion of the even in things that gives rise to unlimitedness; in proof of which it is pointed out that the *gnomon*, which, added to a square produces another square, must itself consist of an odd number of squares.

e	*f*	*g*
b	*c*	*h*
a	*d*	*i*

If three squares, *b*, *c*, *d*, are added to the square *a*, we get a square; and so, too, if five squares, *e*, *f*, *g*, *h*, *i*, are added to that. Or, expressing the same thing arithmetically, we may say it is a property of every odd number that, if added to the number which occupies the same place in the numerical series as it itself does in the series of odd numbers, the result is a square number. Thus:—

$$3 + 1^2 = 2^2$$
$$5 + 2^2 = 3^2$$
$$7 + 3^2 = 4^2$$
$$\text{and } 2n - 1 + (n-1)^2 = n^2$$

The addition of even numbers would yield, on the contrary, what the Pythagoreans called an oblong number.[38] The artificial character of all this shows that it does not belong to the groundwork of the system.

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[38] *Phys.* Γ, 4. 203*a*, 10: καὶ οἱ μὲν τὸ ἄπειρον εἶναι τὸ ἄρτιον· τοῦτο γὰρ ἐναπολαμβανόμενον καὶ ὑπὸ τοῦ περιττοῦ περαινόμενον παρέχειν τοῖς οὖσι τὴν

The numbers spatial.

121. We can now return to the consideration of what the numbers made up of the elements Limit and the Unlimited, Odd and Even, really are. We are told that these elements are brought together in a Harmony, and produce the Even-Odd identified by Aristotle with the One,[39] which partakes in the nature of both. The One or unit, then, is the Unlimited once limited; and, as the Unlimited is space, we see that the Pythagoreans, when they spoke of the One, meant a *point*. In the same way, the number two means a *line*, three a *plane*, four and all higher numbers, the series of regular *polyhedra*. The theory that things are numbers, then, comes simply to this, that things are built up of geometrical figures, that they are portions of space limited in a variety of ways.[40]

This explanation is not accepted by Zeller, and we must therefore consider briefly the objections which he urges against it. His first point is that the undeniably spatial character which the numbers have in the Pythagorean cosmology is only one out of the many which they assume. The unit is not merely a point, but also the soul; two is not merely a line, but also opinion; time, as well as space, comes into the world from outside the heavens. It was only, in fact, in their cosmological

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ἀπειρίαν· σημεῖον δ' εἶναι τούτου τὸ συμβαῖνον ἐπὶ τῶν ἀριθμῶν· περιτιθεμένων γὰρ τῶν γνωμόνων περὶ τὸ ἓν καὶ χωρὶς ὁτὲ μὲν ἄλλο ἀεὶ γίγνεσθαι τὸ εἶδος, ὁτὲ δὲ ἕν. This was the reading both of Simplicius and Alexander; but the words *καὶ χωρίς* are very difficult. Simplicius, amplifying a suggestion of Alexander's, takes it to mean *χωρὶς περιθέσεως σχηματικῆς* (*Phys.* 157 D), *i.e.* as referring to the arithmetical as opposed to the geometrical construction. Is *χωρίον* concealed in it?

[39] Theo. Smyrn. p. 22, 5 Hiller (R. P. 53*a*).

[40] See Arist. *Met.* H, 2. 1028*b*, 15 (R. P. 64*a*). Aristotle is certainly right in what he says as to points, lines, and surfaces; but it was a mistake to call them limits. See § 124 and *n.* 45.

aspect that the numbers were regarded as spatial. Now, if the Pythagorean cosmology were only one part of the system among others, this would be a strong argument; but Zeller has himself furnished the answer to it in his admirable proof[41] that the whole system, so far as it was philosophical at all, was purely cosmological. If the Pythagoreans really did call the soul a unit, it was merely a fancy. The categories with which they worked did not furnish them with the means of distinguishing the soul from a point, and it would certainly never have occurred to them to imagine it as non-spatial. It was a "harmony" of the Limit and the Unlimited like everything else.

Zeller's next argument is drawn from what he calls the purely arithmetical character of the theory; but this would be very hard to establish. Arithmetic, as distinct from geometry, can hardly be said to have existed at all at this date. In the time of Plato the properties of number were studied by means of geometrical constructions, and even so late as Euclid this was still the case.[42] There is evidence enough that the Pythagoreans followed the same method; why else should we hear of "square" and "oblong" numbers, and why should odd numbers have been called gnomons?

Lastly, Zeller urges that the Odd and the Even were the original elements of numbers, and that the Limit and the Unlimited were later additions to the theory. To this we may answer that it is far more probable that the Limit and the Unlimited developed naturally from some such beginning as we find in the second part of Parmenides (§ 77). They are ideas which the earlier course of Greek thought would suggest by itself, while the Odd and Even are only identified with them by a *tour de force*. But, after all, Zeller substantially agrees with the view we have adopted; for he admits that the numbers are spatial in the Pythagorean cosmology, and he also holds that the cosmology was really the whole system.

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[41] Zeller, p. 432 sqq. (Eng. trans. i. p. 498 sqq.).

[42] See esp. *Theait.* 147 D sqq., and compare the method of Euclid, vii.–ix. The use of the zero was unknown in antiquity, and this made all modern arithmetical methods impossible. The value of *position* for purposes of calculation was an Indian invention. The rudimentary form of it represented by the *abacus* belonged to λογιστική, not to ἀριθμητική.

The numbers not abstract spatial figures.

122. It is clear that, if the world is to be regarded as built up of points, lines, and surfaces, these cannot be the abstractions which mathematicians call by these names. Modern geometers regard points, lines, and surfaces as limits; but, as we have seen, the Pythagoreans thought they were a "Harmony" or compound of the Limit and the Unlimited. From this it follows that their points will have magnitude, their lines breadth, and their surfaces thickness. Or, what comes to the same thing, a modern geometer regards a line as having only one dimension; the Pythagoreans identified it with the number two.[43] Surely this is how we must understand what Aristotle tell us about Eurytos in the *Metaphysics*.[44] In order to find the number of anything he used to set pebbles side by side in the shape of the thing and then count them. This was simply a graphic way of showing how many dimensions a thing had, taking a single pebble as one dimension. That Eurytos pushed this to absurd extremities, and tried to find the numbers

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[43] *Met.* Z, 11. 1036*b*, 12 (R. P. 65*a*).

[44] *Met.* N, 5. 1092*b*, 10. Eurytos was a disciple of Philalaos (R. P. 51*a*); yet this shows he held far more primitive views than those of the supposed fragments.

of men, animals, and vegetables by this process, may or may not be true.

If a single pebble represents the unit, then the point must have magnitude. Aristotle says as plainly as possible that the Pythagoreans did regard the point in this way.[45] Zeller holds that this is a mere inference of Aristotle's; and Ritter, though he insists upon the spatial character of the numbers, agrees with Zeller in this. But we must not ignore the fact that the point is already a compound of the Limit and the Unlimited, that is, that it contains something of the *res extensa.* And it is quite easy to believe that, just as the Pythagoreans did not rise to the conception of abstract number, so they did not succeed in representing to themselves abstract determinations of space. It is, indeed, the assumption that points have magnitude which makes the whole theory possible. Given points of this kind, lines can be constructed from them, surfaces from these lines, and bodies from these surfaces. It was, as we shall see (§ 132), against this assumption that the criticism of Zeno was directed.

Other applications of the theory.

123. It was only natural that the Pythagoreans should attempt to apply their theory of numbers to all existing things. The distinction between body and the incorporeal was still unknown, and there seemed to be no reason why everything should not be made up of points just like the framework of the heavens. By far the

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[45] *Met.* M, 6. 1080*b*, 19–20, 30–33; 8. 1083*b*, 14–17; *De Cœlo*, Γ, 1 (R. P. 64*a*), where it is said that the same objections apply to the construction of the world out of numbers as to the construction out of surfaces in Plato's *Timaios.* Later writers, of course, speak as if the Pythagoreans had meant mathematical points without magnitude, and therefore identify ἀριθμός and πέρας. Cf. Alex. in *Met.*, *Schol. Br.* 551*a* (R. P. 64); Nikomachos, *Inst. Ar.* p. 84, 8 Hoche (R. P. 65). Ritter adopted practically the same view.

greater number of the statements which have come down to us on this subject are, however, mere fancies of later times; only a few are guaranteed by the authority of Aristotle.[46] Indeed, Aristotle specially notes that the Pythagoreans only gave numerical definitions of a few things, a statement which of itself is enough to dispense us altogether from considering the great bulk of the traditional definitions. The examples which he gives are Opportunity, Justice, and Marriage. All these certainly lend themselves easily enough to numerical definition. Justice was apparently defined as a square number. Opportunity was identified with the number Seven on various fanciful grounds derived from the importance of that number in human life. The second teeth come at the seventh year, puberty at the fourteenth, the beard at the twenty-first.[47] Besides, as Aristotle ironically adds, there are seven vowels, seven strings in the lyre, seven Pleiads, and Seven against Thebes![48] Marriage was the first harmony between the male (odd) and the female (even), that is to say, the number Five. To the same class of ideas belongs the celebrated table of opposites,[49] to which we must not attach too much importance, as is often done.

Aristotle thinks it necessary to refute these ideas in a passage of the *Metaphysics*,[50] which has hardly perhaps been correctly understood. The Pythagoreans held, he tells us, that in one part of the world Opinion prevailed, while a little above or below it were to be found Injustice or Separation or Mixture, each of which was, according to them, a number. But in these very same regions of the world were to be found bodies having magnitude which were also numbers. How can this be, since Justice has no magnitude? Plato, indeed, got out of the difficulty by distinguishing ideal or intelligible from sensible or materialised numbers; but the Pythagoreans made no such distinction, and therefore, according to Aristotle, they are forced to identify purely ideal things with magnitudes.

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[46] *Met.* M, 4. 1078*b*, 21 (R. P. 66). The statements in *Theol. Arithm.* p. 56 (R. P. 66*b*), are destitute of authority.

[47] For all this see Alex. in *Met.* p. 28, 24 Bonitz (R. P. 66*c*).

[48] *Met.* N, 6. 1093*a*, 13 (R. P. *ib.*).

[49] This table is given in Arist. *Met.* A, 5 (R. P. 55).

[50] *Met.* A, 8. 990*a*, 18 (R. P. 68*e*). I venture to think that Zeller, p. 362, *n.* 1 (Eng. trans. p. 421, *n.* 1), has been prevented from seeing the true force of this passage by his neglect of the spatial character of the numbers. I would translate thus: "For, seeing that, according to them, opinion and opportunity are in a given part of the world, and a little above or below these Injustice and Separation and Mixture, in proof of

So far Aristotle; and it must be confessed that, if these explanations of what are essentially objects of thought, and not of sense, in terms of geometrical construction, had been in any degree important to the system, it would be difficult to consider it seriously. They are surely, however, mere outworks, a mere sport of the analogical fancy, such as we often meet with, even in

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which they allege that each of these is a number (*om.* μέν, A^b); and, seeing that it is also the case (reading συμβαίνῃ with Bonitz) that there is already in that given region a number of magnitudes made up of numbers (no need to insert τοῦτο or ταὐτό) because (keeping the MS. διά) these affections of number go along with each class of regions,—seeing that they hold these two things, the question arises whether the number which we are to understand each one of these things (opinion, etc.) to be is the same (*om.* οὗτος, A^b) as the number in the heavens (*which makes up the material universe*) or a different one." This interpretation has been suggested by that of Emminger (*Vors. Phil. n.* 88), though I cannot see how he can render πλῆθος τῶν συνισταμένων μεγεθῶν, "*eine Menge von zusammentreffenden Begriffen.*" I cannot doubt that these μεγέθη are the extended figures which, the Pythagoreans held, were composed (συνίστανται) of the elements of Number, the Limited and the Unlimited, or, as Aristotle here calls them, the πάθη of number, that is, the Odd and Even. Zeller's view that "celestial bodies" are meant is nearer the truth, but the application is too narrow. Nor is it the number of those bodies which is in question, but their spatial dimensions, etc. See now Z^5, p 391, *n.* 1, recent systems. We must not allow a few stray caprices of this kind to hide from us the central doctrine of the Pythagoreans.

Nor does the formula, that the Pythagoreans confounded the symbol with the conception symbolised, seem historically adequate. It would be truer to say that the important conception ~~of a symbol~~ did not yet exist, and that the Pythagoreans, since they described the soul and a point in the same way, did not, scientifically speaking, see any difference between them. Of course they did not believe practically that their souls were points, but that makes no difference. Science lags behind common sense in some respects as much as it goes before it in others. For common sense is only wrong when it takes itself for knowledge; it really contains, in an indistinct way, much that science has not yet assimilated.

The Decad and Tetraktys.

124. It was natural that the Pythagoreans should attribute a mysterious importance to the decimal system of counting. Aristotle expressly criticises them for looking on it as something essential to the nature of number as such. There is no perfect number, he says; for only that is perfect which has nothing outside it, and number, being infinite, has always something outside it.[51]

The number Four, called the *Tetraktys*, was also regarded with peculiar veneration, no doubt because it was the number which first constituted solid bodies.[52]

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[51] *Phys.* Γ, 6. 206*b*, 32. *Met.* A, 5 (R. P. 54*a*). So, in *Probl.* 910*b*, 24, the question is raised, why all men count up to ten; and the Pythagorean view is mentioned only to be set aside for the simple explanation that men have ten fingers. A Thracian tribe is mentioned who counted only up to four. The Pythagorean view was that, after ten, the numbers were simply repeated.

[52] R. P. 54*a*. This is the original *Tetraktys*, and 1 + 2 + 3 + 4 = 10. The account given in the text seems the most probable explanation, though

These fancies, and others like them, seem to be somehow natural to the human mind.

The cosmology.

125. We have had occasion to mention before (§ 78) that the Pythagoreans did not place the earth in the centre of the world. That was occupied by the central fire, which was apparently identified with the monad, the first harmony of the Limit and the Unlimited. Aristotle tells us[53] that, when the one was formed, the parts of the Unlimited nearest it were gradually drawn in and limited by it. A number of mythological names were given to this central fire; such as Hestia, "the watch-tower," "the castle," or "the throne" of Zeus.

Round the central fire revolve the spheres of the ten heavenly bodies, namely, the heaven of the fixed stars, the five planets, the sun, the moon, the earth, and the *Antichthon*. The "harmony of the spheres" was a natural inference from this.[54]

The earth rotates round the central fire, which we never see, because the side upon which we live is always turned away from it. When it is on the same side of the central fire as the sun we have day; when it is on the other side, night. As the earth is always turned away from the central fire, we never see the Antichthon which is nearer the Hestia; but, for all that, the Antichthon may eclipse the moon by getting between it and the sun. We see from this that it is derived from the "dark planets" of the Ionic School, and is meant to account for

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Arist. *De Cælo*, A, 1. 268*a*, 10, makes the Pythagoreans assign special importance to the *Triad*, on the ground that body has three dimensions. This view must have been held by later (Platonising) Pythagoreans.

[53] *Met.* N, 3. 1091*a*, 17; cf. Stob. *Ekl.* i. 488 (R. P. 68), though the source of the latter passage is suspect. The εἰλικρίνεια τῶν στοιχείων and the distinction between σοφία and ἀρετή are fatal to its authenticity.

[54] Aet. iii. 11 (R. P. 69*c*). For the harmony of the spheres see Arist. *De Cælo*, B, 9. 290*b*, 12 (R. P. 68 B).

the greater frequency of lunar as compared with solar eclipses.[55] We have seen that at this date the sun was commonly supposed to shine by reflected light as well as the moon (§ 91); and there can be no doubt that this was the Pythagorean view. The details cannot, however, be made out. Aristotle tells us nothing about it, while the doxographical tradition is inconsistent, and based on spurious documents.

The Unlimited.

126. Outside the heavens the Unlimited stretches boundlessly, just as with the Ionians, and it is identified on the one hand with Air, and on the other with Darkness. In the *Physics*, Aristotle expressly calls it "breath," and he adds, that the world inhales space from outside.[56] This is merely an application of the old theory of Anaximenes (§ 27).

According to Eudemos, the Pythagorean Archytas proved the infinity of space by asking whether, if one went to its farthest boundary, one could stretch out one's hand with a stick or not.[57] Aristotle has preserved another argument, which is ascribed to Xouthos. If there is no empty space, he said, there can be no rarefaction and condensation, and any movement would make the world overflow.[58]

Things likenesses of numbers.

127. We hear a good deal of a Pythagorean theory that things are not properly speaking numbers, but merely "likenesses" of numbers. This was the version given by Aristoxenos, so we ought probably to under-

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[55] That this was the real origin of the Antichthon appears from Arist. *De Cœlo*, B, 13. 293*b*, 21 : ἐνίοις δὲ δοκεῖ καὶ πλείω σώματα τοιαῦτα (like the Antichthon) ἐνδέχεσθαι φέρεσθαι περὶ τὸ μέσον ἡμῖν ἄδηλα διὰ τὴν ἐπιπρόσθησιν τῆς γῆς. διὸ καὶ τὰς τῆς σελήνης ἐκλείψεις πλείους ἢ τὰς τοῦ ἡλίου γίγνεσθαί φασιν· κ. τ. λ. Of course the other idea given in *Met.* A, 5. 986*a*, 3 (R. P. 69*b*), may have been operative too.

[56] R. P. 63 B, *c*.

[57] Simpl. *Phys.* 467, 26 D (R. P. 63*d*).

[58] Arist. *Phys.* Δ, 9 (R. P. 63*f*).

stand that it was the view of the last generation of the school, and arose under Platonic influence. It is certainly implied in the statement of the *Metaphysics* that Plato borrowed his theory of "participation" from the Pythagorean "imitation,"[59] but the reverse is more probable. The fact is, no doubt, that Aristotle was led into making the statement referred to by Aristoxenos or some of his friends, who would have no hesitation in ascribing to the early Pythagoreans, or even to Pythagoras himself, the doctrines of contemporary Platonising members of the sect. This is not to impute to Aristotle a gross error in the history of philosophy; for we must remember that, in the absence of any Pythagorean literature, he would necessarily derive much of his knowledge from oral communications of this kind. In later times the deception was carried still further, and a letter was forged in the name of Theano, wife of Pythagoras, to the effect that her husband did not say things were made "out of number," but "according to number,"[60] which is practically the doctrine of "Philolaos."

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[59] *Met.* A, 6. 987*b*, 10 (R. P. 54*d*). What this "imitation" means we see from *Met.* A, 5. 985*b*, 27 (R. P. 54*d*), where Aristotle says that the Pythagoreans, brought up as they were in mathematical studies, were led to adopt their peculiar theory from observing many likenesses in things to numbers. These ὁμοιώματα he further explains to be the fanciful analogies discussed in § 123; but it is incredible that a serious system should have had such an origin.

[60] Ap. Stob. *Ekl.* i. 302 (R. P. 54*d*, *fin.*). Simplicius (*Phys.* p. 453, 13 D) and other late writers ascribe the view that the numbers are παραδείγματα, and things, ὁμοιώματα, to Hippasos and the Akousmatics (R. P. 47*c*)!

CHAPTER VIII.

THE YOUNGER ELEATICS.

Relation to predecessors.

128. THE systems we have just been studying were all fundamentally pluralist, and they were so because Parmenides had shown that, if we take a corporeal monism seriously, we must ascribe to reality a number of predicates which are wholly inconsistent with our experience of a world which everywhere displays multiplicity, motion, and change (§ 80). The four inorganic elements of Empedokles and the innumerable organic elements of Anaxagoras were both of them conscious attempts to solve the problem which Parmenides had raised (§§ 84, 103). There is no evidence, indeed, that the Pythagoreans were directly influenced by Parmenides, but there system was pluralist like the rest. Now it was just this prevailing pluralism that Zeno criticised from the Eleatic standpoint; and his arguments were especially directed against Pythagoreanism (§ 132), which his master Parmenides had already attacked in its earlier form (§ 77). Melissos, too, criticises Pythagoreanism (§ 143), but he tries to find a common ground with his adversaries by maintaining the old Ionian thesis that reality is infinite (§ 141).

I. ZENO OF ELEA.

129. According to Diogenes,[1] Zeno flourished in Ol. LXXIX. (464–461 B.C.). This date has probably been arrived at merely by making him forty years younger than his master Parmenides. We have seen already (§ 70) that the meeting of Parmenides and Zeno with the young Sokrates[2] cannot well have occurred before 449 B.C., and Plato tells us that Zeno was at that time "nearly forty years old." He must, then, have been born about 489 B.C., some twenty-five years after Parmenides. He was the son of Teleutagoras, and the statement of Apollodoros that he had been adopted by Parmenides is due solely to a misunderstanding of the language of Plato in the *Sophist*.[3] He was, Plato further tells us,[4] tall and of a graceful appearance. **Life.**

Like Parmenides and most other early philosophers, Zeno seems to have played a considerable part in the politics of his native city. Strabo ascribes to him some share of the credit for the good government of Elea, and says that he was a Pythagorean.[5] This statement may be true, provided we understand by it that he was initiated in the Pythagorean "mysteries," and not that he was a member of the Pythagorean School discussed in our last chapter. He appears to have come into conflict with the ruler of his native city, and the story went that, when asked to reveal the names of his fellowconspirators, he bit out his tongue and spat it in the tyrant's face![6] There seems to be some reference to these events in the passage of Aristotle's *Rhetoric*,[7] which says men are led to acts of violence by an opportunity of avenging either their father or their mother, as in the case of Zeno.

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[1] D. L. ix. 29 (R. P. 103*a*).

[2] *Parm.* 127 B (R. P. 91*d*). The visit of Zeno to Athens is confirmed by Plut. *Per.* 4, which may very likely be based on some contemporary source. From this passage it would appear that Zeno (and therefore Parmenides?) was a member of the Periklean circle.

[3] *Soph.* 241 D (R. P. 103*a*).

[4] *Parm. loc. cit.*

[5] *Geog.* vi. 1. 1 (R. P. 91c).

Writings. 130. Diogenes says there were many books of Zeno's extant;[8] and Souidas mentions some titles which probably come from the Alexandrian catalogues.[9] It is very unlikely, however, that these belonged to works written by Zeno himself. The exposition of Zeno's reasoning in syllogistic form must always have been a very tempting school exercise; and even Aristotle in the *Physics*[10] quotes an argument of Zeno's from a dialogue which can hardly have been written by him. In fact, it is extremely unlikely, to say the least of it, that Zeno ever wrote dialogues. Aristotle himself seems to have implied that he did not,[11] so we must probably understand his allusion in another place[12] to a passage where "the answerer and Zeno the questioner" occurred as referring to a dialogue by some other writer in which Zeno was the chief speaker, and which was very possibly the same as that from which he quotes in the *Physics*.

From the description given in Plato's *Parmenides* we get an idea of what Zeno's chief and, no doubt, only work was like. It contained more than one "discourse," and these discourses were subdivided into sections, each dealing with some one presupposition of his adversaries.[13] We owe the preservation of Zeno's arguments against the Pythagorean view, that reality is a sum of spatial units, to Simplicius. He professes, indeed, to quote one of these *verbatim*;[14] but it looks as if what he had before him was not the original work,[15] but some secondary authority like the *Melissos, Xenophanes, and Gorgias*, perhaps an earlier portion of the same work now no longer extant. The arguments relating to motion have been preserved by Aristotle himself;[16] but he, as his custom is, has restated them in his own language.

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[6] D. L. ix. 26, following the Alexandrian biographers.

[7] A, 12. 1372*b*, 5.

[8] D. L. ix. 26 (R. P. 103).

[9] Souidas, *s.v.* (R. P. 103*d*).

[10] *Phys.* H, 5. 250*a*, 20 (R. P. 104*a*). This must refer to the dialogue from which Simplicius quotes (*Phys. f.* 255*r*; R. P. 104) in his commentary on the passage. But this cannot have been by Zeno; for Protagoras was considerably junior to him. Some work of a similar character to the *φυσικός* of Alkidamas is no doubt meant (cf. Chap. V. *n.* 11).

[11] Ap. D. L. iii. 48 (R. P. 103*b*).

[12] *Soph. El.* 170*b*, 22 (R. P. *ib.*).

Dialectic.

131. Aristotle in his *Sophist*[17] called Zeno the inventor of dialectic, and this is, no doubt, substantially true; though, as we have seen (§ 73), the beginnings at least of that method of arguing were contemporary with the foundation of the Eleatic School. Plato[18] gives us a spirited account of the style and purpose of Zeno's book which he puts into his own mouth—

> In reality, this writing is a sort of reinforcement for the argument of Parmenides against those who try to turn it into ridicule on the ground that, if reality is one, the argument becomes involved in many absurdities and contradictions. This writing argues against those who uphold a Many, and gives them back as good and better than they gave; its aim is to show that their assumption of multiplicity will be involved in still more absurdities than the assumption of unity, if it is sufficiently worked out.

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[13] *Parm.* 127 C. Plato speaks of the first *ὑπόθεσις* of the first *λόγος*. Simplicius refers to the former as *ἐπιχειρήματα*.

[14] *Phys.* 140, 30 D. (R. P. 105 B).

[15] The language is hardly that of Zeno's time, and once (R. P. 105*a*) Simplicius confessedly quotes at second hand from Eudemos.

[16] *Phys.* Z, 9. 239*b*, 9 sqq.

[17] Ap. D. L. ix. 25 (R. P. 103).

[18] *Parm.* 128 C (R. P. 103*d*).

The method of Zeno was, in fact, to take one of his adversaries' fundamental postulates and to deduce from it two contradictory conclusions. This is what Aristotle meant by calling him the inventor of dialectic, which is just the art of arguing, not from true premises, but from premises admitted by the other side. The theory of Parmenides had led to conclusions which contradicted the evidence of the senses, and Zeno's object was not to bring fresh proofs of the theory itself, but simply to show that his opponents' view led to contradictions of a precisely similar nature. If we remember this, we shall not be in any danger of committing the common error of crediting Zeno himself with the beliefs expressed in the major premises of his arguments. On the contrary, we shall be prepared to find that the propositions from which he deduces the unreality of plurality and motion are always such as he himself could not have maintained at all. They are invariably the presuppositions of his opponents.

Zeno and Pythagoreanism.

132. The view that Zeno's dialectic was mainly directed against the Pythagoreans, has been maintained with most force in recent times by Tannery[19] and Bäumker.[20] It will be noticed how much clearer the historical position of Zeno becomes if we follow Plato in assigning him to a somewhat later date than is usual. We have first Parmenides, then the pluralists, and then the criticism of Zeno. It was this that called the atomic theory into existence by showing that, if we are to retain, as the pluralists did, the Parmenidean view of the indestructible reality of body, without adopting the paradoxical conclusion that there is no multiplicity or

[19] *Science hellène*, p. 249 sqq.

[20] *Das Problem der Materie*, p. 60 sqq.

movement, we can only do so by setting a limit to divisibility. Such was certainly the view which Aristotle took of the historical development.[21] Zeller holds, indeed, that it was merely the popular form of the belief that things are many that Zeno set himself to confute;[22] but this can hardly be maintained. The postulate from which all his contradictions are derived is the view that space, and therefore body, is made up of a number of discrete units, and it is surely quite untrue to say that the plain man believes anything of the kind. Nor is it at all probable that Anaxagoras is aimed at.[23] We know from Plato that Zeno's book was the work of his youth.[24] Suppose even that it was written when he was thirty, that is to say, about 459 B.C., Anaxagoras was just taking up his abode at Athens at that time,[25] and it is very unlikely that Zeno had ever heard of him. There is, on the other hand, a great deal to be said for the view that Anaxagoras had read the work of Zeno, and that his emphatic adhesion to the doctrine of infinite divisibility was due to the criticism of his younger contemporary.[26]

What is the unit?

133. The polemic of Zeno was directed in the first instance against the Pythagorean view of the unit. Eudemos, in his *Physics*,[27] quoted from him the saying that "if any one could tell him what the one was, he would be able to say what things are." The commentary

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[21] *Phys.* A, 3. 187*a*, 1 (R. P. 105*c*).

[22] Zeller, p. 539 (Eng. trans. p. 612).

[23] This is the view adopted by Stallbaum in his edition of the *Parmenides* (p. 25 sqq.). Windelband (p. 157) makes the peculiarly unhappy suggestion that Zeno was arguing against the atomic theory.

[24] *Parm. loc. cit.*

[25] Chap. VI. § 99.

[26] Cf., for instance, Anaxagoras, fr. 14, with R. P. 105 B, and R. P. 126*a* with 105 C.

[27] Ap. Simpl. *Phys.* 138, 32 D (R. P. 105*a*)

of Alexander on this, preserved by Simplicius,[28] is quite satisfactory. "As Eudemos relates," he says, "Zeno the disciple of Parmenides tried to show that it was impossible that things could be a many, seeing that there was no unit in things, whereas 'many' means a number of units." Here we have a perfectly clear reference to the Pythagorean view that everything may be reduced to a sum of points. This is what Zeno denied, and it is his greatest title to remembrance that he was the first to grasp clearly the mathematical view of the point as position without magnitude.

This Zeno proved by what Aristotle calls[29] the argument from dichotomy. As preserved by Simplicius, this ran as follows:—

> If things are a many, they must be just as many as they are, and neither more nor less. Now, if they are as many as they are, they will be finite in number.
>
> But again, if things are a many, they will be infinite in number; for there will always be other things between them, and others again between these. R. P. 105 B.

Two contradictory conclusions are here drawn from the same postulate. If a line is made up of points, we ought to be able to answer the question: "How many points are there in a given line?" On the other hand, you can always divide a line or any part of it into two halves; so that, if a line is made up of points, there will always be more of them than any number you assign.

The point is nothing.

134. Zeno's argument against the reality of the point, as preserved by Simplicius, is as follows:—

> If things are a many, they are both great and small; so great

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[28] *Phys.* 99, 13 D.

[29] *Phys.* A, 3. 187*a*, 1 (R. P. 105*c*).

as to be of an infinite magnitude, and so small as to have no magnitude at all.

That which has neither magnitude nor thickness nor bulk, will not even be. "For," he says, "if it be added to any other thing it will not make it any larger; for nothing can gain in magnitude by the addition of what has no magnitude, and thus it follows at once that what was added was nothing.[30] . . . But if, when this is taken away from another thing, that thing is no less; and again, if, when it is added to another thing, that does not increase, it is plain that what was added was nothing, and what was taken away was nothing. R. P. 105 A.

But, if we assume that the unit is something, each one must have a certain magnitude and a certain thickness. One part of it must be at a certain distance from another, and the same may be said of what surpasses it in smallness;[31] for it, too, will have magnitude, and something will surpass it in smallness. It is all the same to say this once and to say it always; for no such part of it will be the last, nor will one thing be non-existent compared with another. So, if things are a many, they must be both small and great, so small as not to have any magnitude at all, and so great as to be infinite. R. P. 105 C.

If we hold that the point has no magnitude,—and this is required by the argument from dichotomy,—then everything must be infinitely small. Nothing made up of points without magnitude can itself have any magnitude. On the other hand, if we insist that the units of which things are built up are something and not nothing, we must hold that everything is infinitely great. The line is infinitely divisible; and, according to this view, it will be made up of an infinite number of units, each of which has some magnitude.

That this argument really does refer to points is proved by an instructive passage from Aristotle's *Metaphysics*.[32] We read there—

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[30] I follow Zeller in marking a lacuna here. Zeno must have gone on to prove that the subtraction of a point would not make a thing less, as is shown by the resumption of the argument which follows.

[31] This is Tannery's rendering; it seems to me to be more satisfactory than those of Zeller and Diels (R. P. 105*d*).

> If the unit is indivisible, it will, according to the proposition of Zeno, be nothing. That which neither makes anything larger by its addition to it, nor smaller by its subtraction from it, is not, he says, a real thing at all; for clearly what is real must be a magnitude. And, if it is a magnitude, it is corporeal; for that is corporeal which is in every dimension. The other things (*i.e.* surfaces and lines) if added in one way will make things larger, added in another they will produce no effect; but the point and the unit cannot make things larger in any way.

Abstract space.

135. Simplicius has preserved an argument which seems to be directed against the Pythagorean doctrine of space—

> If there is space, it will be in something; for all that is is in something, and to be in something is to be in space. This goes on *ad infinitum*, therefore there is no space. R. P. 106.

That this argument has been handed down in an unauthentic form is obvious, though Aristotle already interpreted it as a refutation of the reality of space.[33] But Zeno cannot possibly have wished to deny the spatial extension of the world. What he is really arguing against is the Pythagorean attempt to distinguish space from the body that occupies it (§ 119). If we insist that body must be *in* space, then we must go on to ask what space itself is in. The argument is simply a "reinforcement" of the Parmenidean denial of the void. No doubt the argument that everything must be "in" something, or must have something beyond it, had already been used against the Parmenidean theory of a finite sphere with nothing outside it.

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[32] *Met.* B, 4. 1001*b*, 7 sqq. Surely πάντῃ ὄν must be translated as I have done, on the analogy of the common phrase πάντῃ διαιρετόν and the like.

[33] *Phys.* Δ, 1 and 3 (R. P. 106*a*).

Motion.

136. Zeno's arguments on the subject of motion have been preserved by Aristotle himself. The scope of these is nearly always misunderstood. The system of Parmenides made all motion impossible, and his successors had been driven to abandon the monistic hypothesis in order to avoid this very consequence. Zeno does not bring any fresh proofs, as is commonly supposed, of the impossibility of motion; all he does is to show that a pluralist theory, such as the Pythagorean, is just as unable to explain it as was that of Parmenides. Looked at in this way, Zeno's arguments are no mere quibbles, but important contributions to the subject. They are as follows:—

(1.) You cannot traverse an infinite number of points in a finite time. You must traverse the half of any given distance before you traverse the whole, and the half of that again before you can traverse it. This goes on *ad infinitum*, so that (*if space is made up of points*) there are an infinite number in any given space, and it cannot be traversed in a finite time.[34]

(2.) The second is the famous puzzle of Achilles and the tortoise. Achilles must first reach the place from which the tortoise started. By that time the tortoise will have got on a little way. Achilles must then traverse that, and still the tortoise will be ahead. He is always coming nearer, but he never makes up to it.[35]

The "hypothesis" in the second argument is the same as that in the first, but the reasoning is complicated by the introduction of another moving object. Zeno is here insisting rather upon the fact that, however slowly the tortoise may move, it will always keep ahead, than upon the other side of the case, namely, that Achilles will never make up to it. The first argument showed that no moving object can ever traverse any distance at all, however fast it may move; the second emphasises the fact that, however slowly it moves, it will traverse a practically infinite distance, since, if it moves at all, it must pass through an infinite number of points, *if space is made up of points.*

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[34] *Phys.* Z, 9. 239*b*, 11 (R. P. 107 A, *a*).

[35] *Phys. ib.* 14 (R. P. 107 B, *b*).

(3.) The third argument against the possibility of motion *through a space made up of points* is that, on this hypothesis, an arrow in any given moment of its flight must be at rest in some particular point. Aristotle observes quite rightly that this argument depends upon the assumption that time is made up of "nows," that is, of indivisible instants.[36] This, no doubt, was the Pythagorean view.

The last of these arguments is the most difficult of all, and has been most misunderstood. Eudemos said it was "silly," since the paralogism in it was obvious. But the explanation given by M. Tannery[37] puts it quite on a level with the other three, and makes it the natural consequence of them. According to this view, the argument was directed against a possible answer to the preceding one, namely, that in each indivisible instant the arrow is passing from one point to the next. If so, answered Zeno, motion must always have an equal velocity; for all instants, being infinitely small, are equal.

(4.) Suppose three parallel rows of points[38] in juxtaposition—

Fig. 1.

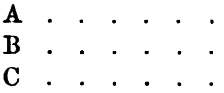
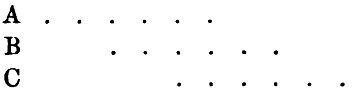


Fig. 2.



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[36] *Phys.* Z, 239*b*, 30 (R. P. 107 C); cf. *ib.* 5 (R. P. 107*c*). In the latter passage Emminger proposes to keep ἢ κινεῖται, which Zeller omits, and to insert after it οὐ κινεῖται δέ. The words ὅταν ᾖ κατὰ τὸ ἴσον mean, "when it occupies a space equal to itself." See, however, Z.[5] p. 598, *n.* 3, *fin.*

[37] *Science hellène*, p. 257.

[38] They must be points if the argument is sound, though they are

One of these (B) is immovable, while A and C move in opposite directions with equal velocity so as to come into the position represented in fig. 2. The movement of C relatively to A will be double its movement relatively to B, or, in other words, any given point in C has passed twice as many points in A as it has in B. It cannot, therefore, be the case that an instant of time corresponds to the passage from one point to another.

Zeno has not here confused absolute and relative motion; he has simply shown that the Pythagorean view of space does not admit of any distinction between them. Nor does he ever, as is usually said, confuse continuous with discrete quantity; on the contrary, his only concern is to show that the view of space as made up of discrete *quanta* leads to as many absurdities as the theory that it is wholly continuous.

II. MELISSOS OF SAMOS.

137. In his *Life of Perikles*, Plutarch tells us, upon the authority of Aristotle, that the philosopher Melissos, son of Ithagenes, was the Samian general who defeated the Athenian fleet in 440 B.C.;[39] and it was, no doubt, for this reason that Apollodoros fixed his "floruit" in Ol. LXXXIV.[40] Beyond this, we really know nothing about him. He is said, of course, to have been, like Zeno, a disciple of Parmenides;[41] but this is most unlikely. The fact that he was a native of Samos makes it more probable that he was originally a member of the Ionic Life.

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called ὄγκοι. This term represents very well the Pythagorean confusion on the subject of points. Cf. what is said of Herakleides and Asklepiades by Ps.-Galen, *Hist. Phil.* 18 (*Dox.* 610, 22). See, however, Z.[5] p. 602, *n.* 1.

[39] Plut. *Per.* 26 (R. P. 109*b*), after Aristotle's Σαμίων πολιτεία.

[40] Ap. D. L. ix. 24 (R. P. 109).

[41] D. L. *loc. cit.*

rather than of the Eleatic School, and we shall see that certain features of his doctrine fully bear out this view. On the other hand, he was certainly convinced by the Eleatic dialectic, and renounced the Ionic doctrine in so far as it was inconsistent with this. We note here the effect of the increased facility of intercourse between East and West, which was secured by the supremacy of Athens.

The first five fragments.

138. Before we go on to examine the fragments, we must discuss the genuineness of some of them.[42] The first five in all the collections are taken from a single passage of Simplicius.[43] This passage is introduced by the words "He opens his work thus," and we shall see that there is a reason for this. But there are a good many curious things about the supposed quotation. First of all, it is not written in the Ionian dialect, though the editors have been careful to conceal the fact by introducing Ionic forms throughout.[44] Now, in all Simplicius' other quotations these Ionic forms are very

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[42] I have thought it best to leave this paragraph exactly as I wrote it in September 1890, before hearing of A. Pabst's dissertation, *De Melissi Samii Fragmentis*. The complete agreement in the results of two independent investigations is a strong confirmation of their truth. On the other hand, I willingly admit that the proof given by Pabst is slightly more cogent than I was able to make it. These views have now been endorsed by Diels (*Arch.* iv. p. 116) and Zeller (Z.[5] 606, *n.* 1), so they may be taken as established. It is perhaps worth noting that Schopenhauer, with his usual insight, had singled out the five fragments we are about to discuss for special condemnation on purely internal grounds.

[43] *Phys.* 103, 13 D sqq. (R. P. 110-113). Pabst notes (p. 17) that when Simplicius quotes fr. 11-14 (p. 111, 11 D) he makes a great point of quoting *αὐτὰ τὰ ἀρχαῖα γράμματα*, which would be pointless if he had done so before.

[44] In R. P. the Ionising process is completely carried out. The only Ionic form to be found in Diels' *Simplicius* is, however, *μετακοσμέοιτο* (p. 104, 1), and this is in a verbal quotation from fr. 12, elsewhere preserved. It is characteristic of Theophrastos to retain an isolated dialectic form here and there (*Dox.* p. 219).

fairly preserved. In the second place, this passage goes over ground which is covered by the other fragments; the form alone is different, the substance is the same. In particular, fr. 5 is word for word the same as fr. 14, except that it has no Ionic forms.[45] Brandis' explanation of this curious fact, namely, that Melissos first sketched his arguments in outline and then went on to discuss them in detail, seems to be generally accepted; but it cannot really be maintained in the face of the actual remains.[46]

We notice, in the next place, that the phraseology of fr. 1–5 is not at all that of Melissos in his other fragments. More modern terms are substituted throughout.[47] Lastly, these fragments are in regular syllogistic form, which would be strange if they had been written in the fifth century B.C.; the Aristotelian expression τὸ ἁπλῶς ὄν[48] occurs in them, and Melissos is made to speak of φυσικοί as if he were not one himself.[49]

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[45] For fr. 5 see R. P. 113. The Ionic forms should all be removed, and the concluding words (οὐχ ὅτι . . . μὴ ὄν) deleted. Fr. 14 (not in R. P.) is given as follows in Simpl. *Phys.* 112, 6 sqq. D: Οὐδὲ κενεόν ἐστιν οὐδέν· τὸ γὰρ κενεὸν οὐδέν ἐστιν· οὐκ ἂν οὖν εἴη τό γε μηδέν. οὐδὲ κινεῖται· ὑποχωρῆσαι γὰρ οὐκ ἔχει οὐδαμῇ, ἀλλὰ πλέων ἐστίν. εἰ μὲν γὰρ κενεὸν ἦν, ὑπεχώρει ἂν εἰς τὸ κενόν· κενοῦ δὲ μὴ ἐόντος, οὐκ ἔχει ὅκῃ ὑποχωρήσει. πυκνὸν δὲ καὶ ἀραιὸν οὐκ ἂν εἴη· τὸ γὰρ ἀραιὸν οὐκ ἀνυστὸν πλέων εἶναι ὁμοίως τῷ πυκνῷ, ἀλλ᾽ ἤδη τὸ ἀραιόν γε κενεώτερον γίνεται τοῦ πυκνοῦ. κρίσιν δὲ ταύτην χρὴ ποιήσασθαι τοῦ πλέω καὶ τοῦ μὴ πλέω· εἰ μὲν οὖν χωρεῖ τι ἢ εἰσδέχεται, οὐ πλέων· εἰ δὲ μήτε χωρεῖ μήτε εἰσδέχεται, πλέων. ἀνάγκη τοίνυν πλέων εἶναι, εἰ κενὸν μὴ ἔστιν. εἰ τοίνυν πλέων ἐστίν, οὐ κινεῖται. It is worth while to compare the two carefully. It will then seem hardly conceivable that the two passages should occur in one work.

[46] As M. Tannery observes: "Malheureusement les citations ultérieures ne donnent guère plus que le résumé lui-même" (*Sc. hell.* p. 266). Pabst shows the truth of this in detail.

[47] For instance, πλῆρες for πλέων (πλέος), ἀδύνατον for οὐκ ἀνυστόν.

[48] Or, as the editors quaintly write, τὸ ἁπλῶς ἐόν (fr. 1). This implies that Melissos, of all people in the world, anticipated Aristotle's discovery that τὸ ὂν πολλαχῶς λέγεται. The true reference of the words is to Simpl. *Phys.* 108, 27 D. They are so far from being the words of Melissos that they do not even belong to the paraphrase, but are an essential part of Simplicius' polemic against Alexander.

Now this is a matter of the greatest importance; for most of the difficulties which have been raised as to the philosophy of Melissos turn upon these first five fragments. If we can show that these are nothing more, and do not even pretend to be anything more, than a paraphrase of fr. 6–14, we may practically dismiss all the controversies about the last of the Eleatics, and confine ourselves to an exposition of the perfectly simple philosophy of the other fragments, which is just as naive as all other pre-Sokratic philosophy, and exhibits no trace of the somewhat turgid idealism which Simplicius succeeded in reading into it.

In the *Physics*[50] Aristotle had criticised the theories of Melissos, and, in order to do so in his own way, he first reduced them into syllogistic form. He analyses his arguments as follows:—

I. If what is came into being, it must have arisen either from nothing or from something.
Neither is possible.
∴ It never came into being.

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[49] The words are συγχωρεῖται γὰρ καὶ τοῦτο ὑπὸ τῶν φυσικῶν (fr. 1; R. P. 110). We can understand this in the mouth of a Peripatetic who was anxious to show that Melissos arrived at his theory by starting from the postulates of the φυσικοί (cf. Simpl. *Phys.* 103, 13 D; R. P. 110). But the theory that Melissos was ἀφυσικός is purely Aristotelian (*Phys.* A, 2. 184*b*, 25). He himself, who entitled his work Περὶ φύσεως, would not have appreciated the distinction. To prove that Melissos might have talked in this way, Brandis quoted Diogenes of Apollonia, ap. Simpl. *Phys.* 151, 24 D; but see R. P. 160*a*, and Chap. IX. *n.* 36.

[50] *Phys.* A, 3. 186*a*, 10 sqq. (R. P. 111*a*). I can make nothing of 186*a*, 13-16; Offner (*Arch.* iv. 27) deletes the words as a gloss.

II. Everything which has come into being has a beginning and end.
∴ What has not come into being has no beginning or end (*sic*).

III. What has not come into being has no beginning or end (II.).
What is has not come into being (I.).
∴ What is has no beginning or end.

IV. What has neither beginning or end is infinite.
What is has neither beginning or end (III.).
∴ What is, is infinite.

Aristotle points out quite rightly that the second of these arguments is a false conversion; and, as a matter of fact, we do find some such conversion as this implied in fr. 7 and 8, so we have enough to account for Aristotle's judgment, without supposing fr. 1–5 to be genuine.

In commenting upon this judgment, Simplicius does what any commentator would naturally do. He gives a paraphrase of the opening fragments of Melissos reduced to correct Peripatetic form, in order that the criticisms of Aristotle might be more readily understood. Did Simplicius compose this paraphrase himself? I think this is not in accordance with what we know of his procedure elsewhere. And it is a striking fact that, just a little before, the faulty conversion of Melissos is quoted along with the syllogistic version of the argument of Parmenides, which undoubtedly comes from the *Opinions* of Theophrastos.[51] It seems, then, most probable that here, as elsewhere, Simplicius had recourse to the extracts of Theophrastos preserved by Alexander, and that fr. 1–5 should be removed from editions of Melissos and inserted in the *Doxographi Græci.*

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[51] Cf. Theophr. *Phys. Op.* fr. 7 (*Dox.* p. 483). My view is perhaps confirmed by the fact that Philoponos too (*Phys.* p. 51, 20, Vitelli)

The genuine fragments.

139. We may now go on with a good conscience to the genuine fragments. For convenience of reference I preserve the numbering of Brandis—

(1.) If nothing is, what can be said of it as of something real? R. P. 110.[52]

(2.) What was was ever, and ever shall be. For, if it had come into being, there needs must have been nothing before it came into being. Now, if nothing were to exist, in no wise could anything have arisen out of nothing. R. P. 110*a*.

(7.) Since, then, it has not come into being, and since it is, it was ever and ever shall be, and has no beginning or end, but is infinite.[53] For, if it had come into being, it would have had a beginning (for it would have begun to come into being at some time or other) and an end (for it would have ceased to come into being at some time or other); but, if it neither began nor ended, it ever was and ever shall be, and has no beginning or end; for it is not possible for anything to be ever without being all. R. P. 111*a*, *fin.*

(8.) Further, just as it ever is, so it must ever be infinite in magnitude (for if it had bounds, it would be bounded by empty space).[54] R. P. 111*a*, *init.*

(9.) But nothing which has a beginning or end is either eternal or infinite.

(10.) For if it is (infinite), it must be one; for if it were

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speaks of τὸ ἁπλῶς ὄν in giving the argument of Melissos. Pabst assumes that Simplicius himself wrote the paraphrase.

[52] Though these words occur at the beginning of the paraphrase we have been discussing, I believe them to be genuine. They seem to be attested by M. X. G. *init.*

[53] That is, *temporally* infinite; see below, § 140. I take the last words of the fragment to mean "a thing cannot be temporally infinite (eternal) without being all" (and therefore without beginning, according to the usual Eleatic argument).

[54] I have inserted the last part of this fragment from Arist. *Gen. Corr.* A, 8. 325*a*, 13.

two, it could not be infinite; for then it would be bounded by another.[55] R. P. 112*a*.

(10*a*.) (And, since it is one, it is alike throughout; for if it were unlike, it would be many and not one.)[56]

(11.) So then it is eternal and infinite and one and all alike. And it cannot perish nor become greater, nor does it suffer pain or grief. For, if any of these things happened to it, it would no longer be one. For if it is altered, then the real must needs not be all alike, but what was before must pass away, and what was not must come into being. Now, if the all had changed by so much as a single hair, in thirty thousand years, it would all perish in the whole of time. R. P. 113*a*.

(12.) Further, it is not possible either that its order should be changed; for the order which it had before does not perish, nor does that which was not come into being. But, since nothing is either added to it or passes away or is altered, how can any real thing have had its order changed? For if anything became different, that would amount to a change in its order. R. P. *ib*.

(13.) Nor does it suffer pain; for the All cannot be in pain. For a thing in pain could not be ever, nor could it have the same power as what is whole. It is only from the addition or subtraction of something that it could feel pain, and then it would no longer be like itself. Nor could what is whole possibly begin to feel pain; for then what was whole and what was real would pass away, and what was not would come into being. And the same argument applies to grief as to pain. R. P. *ib*.

(14.) Nor is anything empty. For what is empty is nothing. . . . What is nothing, then, cannot be.

Nor does it move; for it has nowhere to betake itself to, but is full. For if there were empty space, it would betake itself to empty space. But, since there is no empty space, it has no place to betake itself to.

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[55] This fragment is quoted by Simpl. *De Cælo* (*Schol. Br.* p. 509*b*, 1). See Pabst, p. 27. The argument requires the insertion of the word ἄπειρον, which is confirmed by the paraphrase, fr. 3 (R. P. 112), by Simpl. *Phys.* 110, 5 D (R. P. 112*a*), and by M. X. G. 974*a*, 11.

[56] The actual words of this fragment are nowhere quoted; but it is attested by the summary at the beginning of fr. 11. It is represented in the paraphrase, fr. 4 (R. P. 113), and in M. X. G. 974*a*, 13 (R. P. 112*a*).

And it cannot be dense and rare; for it is not possible for what is rarefied to be as full as what is dense, but what is rare is *ipso facto* emptier than what is dense.

This is the way in which we must distinguish between what is full and what is not full. If a thing has room for anything else, and takes it in, it is not full; but if it has no room for anything and does not take it in, it is full.

Now, it must needs be full if there is no empty space, and if it is full, it does not move (*n.* 45).

(15.) If what is real is divided, it moves; but if it moves, it cannot be all at once. R. P. 112*a*.

(16.) Now, if it were to exist,[57] it must needs be one; but if it is one, it cannot have body; for, if it had body it would have parts, and would no longer be one. R. P. 114.

(17.) This argument, then, is the greatest proof that it is one alone; but the following are proofs of it also. If it were a many, these would have to be of the same kind as I say that the one is. For if there is earth and water, and air and iron, and gold and fire, and if one thing is living and another dead, and if things are black and white and all that men say they really are,—if that is so, and if we see and hear aright, each one of these must be such as we at first concluded that reality was, and they cannot be changed or altered. Whereas we say that we see and hear and understand aright, and yet we believe that what is warm becomes cold, and what is cold warm; that what is hard turns soft, and what is soft hard; that what is living dies, and that things are born from what lives not; and that all those things are changed. We think that iron, which is hard, is rubbed away with the finger, passing away in rust;[58] and so with gold and stone and everything which we fancy to be strong, so that it turns out that we neither see nor know realities. Earth, too, and stone are formed out of water. Now these things do not agree with one another. We said that there were many things that were eternal and had forms and strength of their own, and yet we fancy that they all suffer alteration, and that they change with each perception. It is clear, then, that we did not see aright after all, nor are we right in believing that all these things are many. They would not change if they were real, but each thing would be just what we believed it to be; for nothing is stronger than true reality. But if it has changed, what was has passed away, and what was not is come into being. So then, if there were many things, they would have to be just of the same nature as the one. R. P. 115.

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[57] The MSS. of Simpl. *Phys.* 110, 1 D, have εἴη not ἐστίν, which is a mere conjecture of Brandis; see below, § 143. Further, E F read εἰ μὲν οὖν εἴη, which is, no doubt, correct.

[58] Reading ὑπ' ἰοῦ ῥέων with Z.^{5} 613, *n.* 1.

Theory of reality.

140. It has been pointed out that, in all probability, Melissos was not originally a member of the Eleatic School; but he certainly adopted all the views of Parmenides as to the true nature of reality with one remarkable exception. He appears to have opened his treatise with a reassertion of the Parmenidean "Nothing is not" (fr. 1), and the arguments by which he supported this view are those with which we are already familiar (fr. 6). Reality, as with Parmenides, is eternal, an attribute which Melissos expressed in a way of his own (fr. 7). He does not say with the founder of Eleaticism (v. 96) that time is a mere figment; his relations with the Ionic School perhaps made this seem unnatural to him. As we shall see, he believed reality to be spatially infinite, and it was therefore natural for him to regard it as temporally infinite also. This way of putting the matter has led, however, to many serious misunderstandings; and Melissos has been charged, on the strength of some wrongly interpreted sayings of Aristotle, with confusing spatial and temporal infinity. The argument of fr. 7 has actually been supposed to be, that since reality has no beginning in time it must be infinite in space.[59] But surely the human

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[59] So Zeller, p. 555 (Eng. trans. p. 631), and practically all other writers on the subject. This view goes back to Themistios, p. 115 sq. Spengel,

mind is not capable of such an astounding confusion of thought, and least of all so in an age when men operated, not with abstract concepts, but with vivid perceptions. We have seen above[60] what the logical fallacy detected by Aristotle in the reasoning of Melissos really was, and we must certainly understand the argument of fr. 7 as referring entirely to time. Temporal infinity has taken the place of eternity.[61]

Reality spatially infinite.

141. Melissos differed from Parmenides in holding that reality was spatially as well as temporally infinite. His reason for this was not the imaginary argument just discussed, but the excellent one that, if it is limited, it must be limited by something else (fr. 8). Perhaps this was borne in upon him by such arguments as that attributed

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Simplicius in *Phys.* A, 3, and perhaps still earlier to M. X. G. (974*a*, 9-11). See, however, Apelt in *N. Jahrb.* 1886, p. 729. The true account of the matter has, I think, been given by Offner, *Zur Beurtheilung des Melissos*, *Arch.* iv. p. 12 sqq. Zeller (p. 554, *n.* 3, Eng. trans. p. 630, *n.* 1) supposed that Aristotle was misled by a false construction of fr. 2; but this theory must now disappear with fr. 2 itself.

[60] That the fallacy pointed out by Aristotle was really the illegitimate conversion noted on p. 337, is obvious from *Soph. El.* 5. 167*b*, 13 sqq., where it is quoted and compared to the argument, "If a man in a fever is hot, then a man who is hot must have a fever." The Greek commentators say nothing of the alleged confusion of time and space either here or in their commentary on the passage from the *Physics* (*n.* 50). *Met.* A, 5. 986*b*, 25 (R. P. 84), is quite general, but rather implies formal inaccuracy of reasoning than confusion of concepts; for the ἀγροῖκος is the opposite of the πεπαιδευμένος who knows the rules of correct reasoning. I cannot see the difficulty which Offner himself admits in *Soph. El.* 28. 181*a*, 27. "For, if what has come into being has a beginning, he lays down that what has not come into being has no beginning, so that, according to him, if the world had no origin it is (temporally) infinite. That is not so; for this is a simple conversion of a universal affirmative" (Bonitz, *Ind. s.v.* ἀντιστρέφειν, 2). If I am right, this strongly confirms Offner's view.

[61] The possibility of the word ἄπειρος being used at this date in a temporal sense cannot be doubted. Anaxagoras already found it necessary to add restrictive accusatives to define the sense in which he wished it to be understood. So fr. 1, 4, 6.

to Archytas (§ 126); no doubt, too, he was influenced by his Ionic predecessors, who had all regarded the primary substance as boundless. Parmenides had thought it possible to regard reality as a finite sphere, but it would have been difficult for him to work out this view in detail. He would have had to say there was nothing outside the sphere; but no one knew better than he did that there is no such thing as nothing. And this is no mere verbal quibble; for nothing was identified with empty space. Melissos saw that you cannot imagine a finite sphere without imagining it as surrounded by an infinite empty space;[62] and as, in common with the rest of the school, he denied the void altogether (fr. 14), he was forced to say reality was spatially infinite (fr. 8).

From the infinity of reality, it follows that it must be one; for, if it were not one, it would be bounded by something else (fr. 10). And, being one, it must be homogeneous throughout (fr. 10*a*), for that is what we mean by one. Reality, then, is a single, homogeneous, corporeal *plenum*, stretching out to infinity in space, and going backwards and forwards to infinity in time.

Opposition Ionians.

142. Eleaticism was always critical, and we are not without indications of the attitude taken up by Melissos towards contemporary systems. The flaw which he found in the Ionian theories was that they all assumed some want of homogeneity in the One, which is a real inconsistency. Further, they all allowed the possibility of change; but, if all things are one, change must be a form of coming into being and passing away. If you admit that a thing can change, you cannot maintain that it is eternal (fr. 11). Nor can the arrangement of the parts of reality alter (fr. 12), as Anaximander, for

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[62] Note the disagreement with Zeno (§ 135).

instance, had held; any such change necessarily involves a coming into being and passing away.

The next point made by Melissos (fr. 13) is somewhat peculiar. Reality, he says, cannot feel sorrow or pain; for that is always due to the addition or subtraction of something, which is impossible. It is not easy to be sure what this refers to. Perhaps it is to the theory of Herakleitos with its Want and Satiety, perhaps to something of which no record has been preserved.

Motion in general[63] and rarefaction and condensation in particular are impossible; for both imply the existence of empty space (fr. 14). Divisibility, too, is excluded for the same reason (fr. 15). These are the same arguments which Parmenides had employed already (§ 74).

Opposition to Pythagoreans.

143. In nearly all accounts of the system of Melissos, with the exception of Bäumker's,[64] we find it stated that he denied the corporeality of what is real,—an opinion which is supported by a reference to fr. 16, which is certainly quoted by Simplicius to prove this very point. If, however, our general view as to the character of early Greek Philosophy is correct, this statement must seem quite incredible. And it will seem even more surprising when we find that in the *Metaphysics*[65] Aristotle says that, while the unity of Parmenides seemed to be ideal, that of Melissos was material. Nor is the explanation of Zeller,[66] namely,

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[63] Bäumker (*N. Jahrb. f. Phil.* 1886, p. 541 sq.) held that Melissos, like Plato and Descartes, admitted the doctrine of ἀντιπερίστασις or motion *in pleno* (so *Das Problem der Materie*, p. 59). He relies, of course, upon the concluding words of "fr. 5" (R. P. 113). But these words are not only not a fragment of Melissos, the context shows conclusively that they are not even a paraphrase of him, but merely part of Simplicius' own argument against Alexander. See Pabst, p. 10 sqq.

[64] *Das Probl. d. Mat.* p. 57 sqq.

[65] *Met.* A, 5. 986*b*, 18 (R. P. 84).

[66] Zeller, p. 556 (Eng. trans. p. 631).

that "matter" with Aristotle is different from "body," satisfactory; for it does not make it clear how, at this date, any one could suppose anything but body to be spatially infinite.

Now it has already been pointed out, in the note to fr. 16, that a considerable liberty has been taken with the text by Brandis and all subsequent commentators. As it stands in the MSS. of Simplicius, the fragment puts a purely hypothetical case, while Brandis turns it into an exposition of the writer's own views. As it stands, it would most naturally be understood as a disproof of the existence of something on the ground that, if it existed, it would have to be both corporeal and one. This argument cannot, then, refer to the Eleatic One, in which Melissos himself believed. So far Bäumker has seen;[67] but it has not yet, I think, been pointed out that the view which this argument would refute is simply the Pythagorean theory of the spatial unit; and the argument is, in fact, almost verbally the same as one of Zeno's.[68] We conclude, then, Melissos did not, any more than any other pre-Platonic philosopher, regard reality as incorporeal, and that, like Zeno, he argued against the Pythagorean theory of corporeal points.

The only possible objection to this view is that Simplicius, who twice quotes the fragment,[69] certainly took it in the sense usually given to it. But it was very natural for him to make this mistake. "The One" was an expression that had two senses in the middle of the fifth century B.C.; it meant either the whole of reality or the point as a spatial unit. To maintain it in the first sense, the Eleatics were obliged to disprove it in the second; and so it sometimes seemed that they were speaking of their own "One" when they really meant the other. We know from Simplicius himself[70] that this very mistake had actually been made by some of his predecessors with regard to Zeno, and he has simply made the same error himself in the present case.

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[67] *Das Probl. d. Mat.* p. 59, *n.* 6. So, too, Z.^{5} p. 611, *n.* 2.

[68] See above, § 134 (R. P. 105*c*), especially the words: *εἰ δὲ ἔστιν, ἀνάγκη ἕκαστον μέγεθός τι ἔχειν καὶ πάχος.*

[69] *Phys.* pp. 87, 6 and 110, 1 D.

Opposition to Anaxagoras.

144. The most remarkable fragment of Melissos is, perhaps, the last (fr. 17). It seems to be directed against Anaxagoras; at least the language used seems more applicable to him than to any one else. Anaxagoras had admitted (§ 113, *fin.*) that, so far as our perceptions go, they do not entirely agree with his theory, though he holds that this is due solely to their weakness. Melissos, taking advantage of this admission, urges that, if we give up the senses as the ultimate test of reality, we are not entitled to reject the Eleatic theory. With wonderful penetration he points out that if we are to say, with Anaxagoras, that things are a many, we are bound also to say that each one of them is such as the Eleatics declared the One to be. In other words, the only consistent pluralism is the atomic theory.

Melissos has long been unduly depreciated owing to the sneers of Aristotle; but these, we have seen, are based upon nothing more than a somewhat pedantic objection to the false conversion in the early part of the argument. Melissos knew nothing about the rules of conversion, and if he had, he could easily have made his reasoning formally correct without modifying his system. His greatness consisted in this, that not only was he the real "systematiser" of Eleaticism, as Bäumker justly calls him,[71] but he was also able to see, before the pluralists saw it themselves, the only way in which the theory that things are a many could be consistently worked out. We shall see in the next chapter how this was done; at present we have only to call attention to the penetration displayed by Melissos in his estimate alike of the past history of philosophy and of its future development, and to protest against the unjust estimate of him which has so long prevailed.[72]

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[70] *Phys.* p. 138, 29 D sqq.

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[71] *Das Problem der Materie*, p. 57.

[72] Bäumker, *op. cit.* p. 58, *n.* 3: "That Melissos was a weakling is a *fable convenue* that people repeat after Aristotle, who was unable to appreciate the Eleatics in general, and in particular misunderstood Melissos not inconsiderably."

CHAPTER IX.

THE REVIVAL OF PHILOSOPHY IN IONIA.

The revival and its character.

145. THE victories of Kimon as general of the maritime confederacy headed by Athens had delivered the Ionians from the fear of Persia, and one result of this was a great renewal of scientific activity in the cities of Asia Minor. The revival took several forms. It was not unnatural that philosophy should seek at first to run in its old channels, and we hear once more of men who maintained the early Milesian theories. No doubt the school had gone on existing in an obscure way ever since the time of Anaximenes (§ 98), though perhaps its seat had been shifted to the neighbouring Samos. Hippon was probably a native of that island, and so was Melissos, who may well have been a member of the society in his youth (§ 137). We note also that the views of Anaxagoras had been widely disseminated at this time, probably by the school at Lampsakos (§ 100), and we shall have to study a remarkable attempt to fuse them with the system of Anaximenes. But it was Miletos that produced Leukippos, the man who virtually brought the first period in the history of Greek philosophy to a close by putting forward the most complete explanation of the world that could be given on the hypothesis then prevalent. It was with Miletos we began, and with Miletos we shall end; for the subse-

quent activity of the school at Abdera, so far as it was original, belongs to the next period in the development of science.

I. *Hippon of Samos.*

146. We know very little indeed of Hippon, except that he was a contemporary of Perikles. From the scholiast on Aristophanes[1] we learn that Kratinos satirised him in his *Panoptai*, and Aristotle mentions him in the enumeration of early philosophers given in the First Book of the *Metaphysics*,[2] though only to say that the inferiority of his intellect deprives him of all claim to be reckoned among them.

Moisture.

With regard to his views, the most precise statement is that of Alexander, who doubtless follows Theophrastos.[3] It is to the effect that he held the primary substance to be Moisture, without deciding whether it was Water or Air.[4] We have the authority of Aristotle[5] and Theophrastos, represented by Hippolytos,[6] for saying that this theory was supported by physiological arguments of the kind common at the time.

Till quite recently no fragment of Hippon was known to exist, but a single one has just been recovered from the Geneva Scholia on Homer.[7] It is directed against the old assumption that the "waters under the earth" are an independent source of moisture,[8] and runs thus:—

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[1] Schol. on *Clouds*, 96. See Bergk, *Reliquiæ Com. Att.* pp. 164–185.

[2] *Met.* A, 3. 984*a*, 3 (R. P. 172*a*).

[3] That Theophrastos did say something about Hippon is proved by the fact that Hippolytos has preserved an extract relating to him; cf. *n.* 6.

[4] Alex. in *Met.* 21. 17, Bon. (R. P. 172).

[5] *De An.* A, 2. 405*b*, 2 (R. P. 173 A).

[6] *Ref.* i. 16 (R. P. 173 B).

[7] *Schol. Gen.* i. 198, 10. Cf. Diels in *Arch.* iv. 653. The extract, like the lines from Xenophanes, fr. 11, comes from the Homeric commentary by Krates of Mallos (*c.* 167 B.C.), the chief opponent of Aristarchos.

> The waters we drink are all from the sea; for if wells were deeper than the sea, then it would not, doubtless, be from the sea that we drink, but from some other source. But as it is, the sea is deeper than the waters, so all the waters that are above the sea come from it.

We observe here the universal assumption that water tends to rise from the earth, not to sink into it.

Along with Hippon, Idaios of Himera[9] may just be mentioned. We know nothing of him except that he held air to be the primary substance.

II. *Leukippos of Miletos.*

Life.

147. The very existence of Leukippos has been called in question by E. Rohde on the ground of a characteristic statement by Epicurus, that there never was such a philosopher at all.[10] This question is intimately bound up with that as to the date of Demokritos. If we hold with Diels that Demokritos cannot have been born before 460 B.C.,[11] we can hardly admit that he was the real originator of the atomic theory; for there are undeniable traces of atomism at a time when, on this view, he would have been too young to work out a theory of reality.

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[8] Chap. I. § 9.

[9] Sext. *Math.* ix. 360.

[10] For the literature of this controversy see R. P. 143*b*, *fin.* The remark of Epicurus is quoted in D. L. x. 13 (R. P. 143*b*). It apparently occurred in the course of a tirade, intended to show that Epicurus was not indebted to any predecessor. On other occasions, however, he appears to have argued against Leukippos, and distinguished him from Demokritos. See Usener, *Epicurea*, *Index Nominum*, *s.v.*

[11] *Rh. Mus.* xxxi. 29. Demokritos said himself that he wrote the Μικρὸς διάκοσμος 730 years after the fall of Troy. If he used the same era as Ephoros, 1150 B.C., this would give 420 B.C. as the date of that work.

It is certain, too, as we shall see, that Aristotle attributed the discovery of the atomic theory to Leukippos, and that Theophrastos[12] ascribed to him a work that usually went by the name of Demokritos.[13]

Rohde makes much of the way in which Leukippos is slurred over by every one except Aristotle and Theophrastos. If, he argues, Demokritos was to Leukippos merely what Theophrastos was to Aristotle, or Reinhold to Kant, how is it that we find every one ascribing to him the chief share in the glory of inventing the atomic theory? To this question Rohde has himself supplied the answer in a footnote to one of his articles.[14] He points out there, quite correctly, that the common view implies the existence of a regular atomistic school at Abdera. So it undoubtedly does; the treatises which were collected in the "works" of Demokritos must have bee due to the co-operation of a whole society, so that it became impossible to say who in particular was the real originator of any theory set forth in them. But this, as we know now (§ XII.), is very far indeed from being an objection. It is much more likely than not that the working out of the atomic theory was not, properly speaking, due to any one man. Later antiquity studied it in the more elaborate form which it attained under Demokritos, and this sufficiently accounts for the way in which Leukippos is ignored. We shall therefore, with

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[12] Ap. D. L. ix. 46 (R. P. 143*b*).

[13] The Μέγας διάκοσμος (R. P. 143*b*). In Stob. *Ekl.* i. 160, a sentence is quoted which purports to come from a work by Leukippos on *Nous*. Zeller is inclined to agree with Heeren that there is some confusion here with Demokritos. The remark in R. P. 143*b*, that the quotation goes back to Theophrastos, is inaccurate. It is very doubtful whether it comes even from the *Vetusta Placita* (*Dox.* p. 215). In M. X. G. 980*a*, 8, we have the phrase ἐν τοῖς Λευκίππου καλουμένοις λόγοις.

[14] *Jahrb. f. Kl. Phil. u. Päd.* vol. cxxiii. p. 742.

Diels, follow Aristotle and Theophrastos in regarding him as the real originator of the system.[15]

The latter authority further tells us that Leukippos was a member of the Eleatic School, and perhaps, though this is more than doubtful, that he had been a disciple of Zeno.[16] It is certainly more likely that he had "heard" Melissos, who lived so near his own home, and who had actually uttered the formula of atomism, though he did not adopt it (§ 144).

The theory of Leukippos.

148. Theophrastos, in the First Book of his *Opinions*, wrote of Leukippos somewhat as follows:—

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[15] The argument of Diels is briefly as follows:—According to Theophrastos, Diogenes of Apollonia borrowed some of his theories from Anaxagoras and some from Leukippos (R. P. 159*a*). Diogenes, as Rohde has admitted (*Jahrb. f. Kl. Phil.* cxxiii. p. 146), is parodied in the *Clouds* of Aristophanes, which was produced in 423 B.C. Now Demokritos, according to Apollodoros, did not "flourish" till 420 B.C., a date founded on that of the Μικρὸς διάκοσμος (*n.* 11); and if this is right, any traces of atomism to be found in Diogenes must be due to an earlier thinker. And Diels holds that Apollodoros must be nearly right (cf. also Busolt, *Gr. Gesch.* ii. p. 307, *n.*); for his calculation is confirmed by the remark of Demokritos himself (R. P. 144 B), that he was a young man in the old age of Anaxagoras. This seems to imply that Anaxagoras was already dead, and we know that he survived his expulsion from Athens. If, as seems probable, Demokritos when a young man "heard" Anaxagoras at Lampsakos after 430 B.C., he can hardly have founded his own school at Abdera before 420; and the fact that Diogenes had published before that year a work bearing traces of the atomic theory, proves that theory to be earlier than Demokritos. On the other hand, Zeller (pp. 852, 920; Eng. trans. ii. pp. 306, 381) surely goes too far in holding that there are traces of the atomic theory even in Anaxagoras and Melissos.

[16] *Dox.* p. 483 (R. P. 143). The words κοινωνήσας Παρμενίδῃ τῆς φιλοσοφίας do not, of course, imply personal intercourse with Parmenides any more than the precisely similar statement as to the relation between Anaxagoras and Anaximenes (Chap. VI. § 98). They mean nothing more than that L. had been an Eleatic. The relationship to Zeno is mentioned both by Hippolytos (*Ref.* i. 12. 1) and D. L. ix. 30 (R. P. 143*a*). Diels is accordingly inclined to believe that Zeno's name has dropped out of the Theophrastean extract preserved by Simplicius (*Dox.* p. 483, *n. a*, 11). But the view in question would arise at once from the belief that L. was a native of Elea (*n.* 17), and the relation to Melissos suggested in the text seems far more probable.

Leukippos of Elea or Miletos (for both accounts are given of him[17]) had been an adherent of the Parmenidean philosophy; he did not, however, follow the same path in his explanation of things as Parmenides and Xenophanes did, but, to all appearances, the very opposite (R. P. 143). They made the All one, immovable, uncreated, and finite, and did not even permit us to search for *what is not;* he assumed innumerable and ever-moving elements, namely, the atoms. And he made their forms infinite in number, since there was no reason why they should be of one kind rather than another, and because he saw that there was unceasing becoming and change in things. He held, further, that *what is* is no more real than *what is not*, and that both are alike causes of the things that come into being; for he laid down that the substance of the atoms was compact and full, and he called them *what is*, while they moved in the void which he called *what is not*, but affirmed to be just as real as *what is* (R. P. 148 B).

Leukippos and the Eleatics.

149. It will be observed that Theophrastos, while noting the affiliation of Leukippos to the Eleatic School, points out that his theory is, *prima facie*,[18] just the opposite of that maintained by Parmenides. Many historians of philosophy have been led by this appearance to discredit the Eleaticism of Leukippos altogether;

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[17] It is easy to see how Leukippos might come to be regarded as a native of Elea, but it is hard to understand why he should be called a Milesian unless he really was so. The statement of D. L. ix. 30 (R. P. 143*a*), that he was a Melian, is, no doubt, due to a simple clerical error, helped by a reminiscence of Diagoras the atheist. The opposite mistake is to be found in Aetios (i. 7. 1), where Diagoras is called a Milesian in the two best MSS. of the *Placita*, an error repeated by Eusebios and Theodoret. The Ps.-Galen and the inferior Parisian MS. (C) have alone preserved the true reading (*Dox.* p. 14). The certainly erroneous tradition that Demokritos was a Milesian, preserved by D. L. ix. 34 (R. P. 144*a*), confirms our view as to Leukippos. Demokritos has been called a Milesian from precisely the same confusion of ideas that made Leukippos an Eleate. On the other hand, Leukippos appears as an Abderite in Ps.-Galen, *H. Phil.* fr. 3 (*Dox.* p. 601, 9).

[18] The words ὡς δοκεῖ do not imply assent to the view introduced by them.

but nothing can be more superficial than such a doubt, and we must not suppose Theophrastos himself believed the two theories to be so far apart as they seem. As this is really one of the most important points in the whole history of early Greek philosophy; and as, rightly understood, it furnishes the key to the whole development, it will be worth while to transcribe at length a passage of Aristotle[19] in which the connection between Eleaticism and Atomism is explained in a way that leaves nothing to be desired.

> Leukippos and Demokritos have decided about all things practically by the same method and on the same theory, taking as their starting-point what naturally comes first. Some of the ancients had held that the real must necessarily be one and immovable; for, said they, empty space is not real, and motion would be impossible without empty space separated from matter; nor, further, could reality be a many, if there were nothing to separate things. And it makes no difference if any one holds that the All is not continuous, but discrete, with its parts in contact (*Pythagorean view*), instead of holding that reality is many, not one, and that there is empty space. For, if it is divisible at every point there is no one, and therefore no many, and the Whole is empty (*Zeno*); while, if we say it is divisible in one place and not in another, this looks like an arbitrary fiction; for up to what point and for what reason will part of the Whole be in this state and be full, while the rest is discrete? And, on the same grounds, they further say that there can be no motion. In consequence of these reasonings, then, going beyond perception and overlooking it in the belief that we ought to follow the argument, they say that the All is one and immovable, and some of them that it is infinite (*Melissos*), for any limit would be bounded by empty space. This, then, is the opinion they expressed about the truth, and these are the reasons which led them to do so. Now, so far as arguments go, this conclusion does seem to follow; but, if we appeal to facts, to hold such a view looks like madness. No

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[19] *Gen. Corr.* A, 8. 324*b*, 35 sqq. (R. P. 148 A).

one who is mad is so far out of his senses that fire and ice appear to him to be one; it is only things that are right, and things that appear right from habit, in which madness makes some people see no difference.

Leukippos, however, thought he had a theory which was in harmony with sense-perception, and did not do away with coming into being and passing away, nor motion, nor the multiplicity of things. He made this concession to experience, while he conceded, on the other hand, to those who invented the One that motion was impossible without the void, that the void was not real, and that nothing of what was real was not real. "For," said he, "that which is, strictly speaking, real is an absolute *plenum;* but the *plenum* is not one. On the contrary, there are an infinite number of them, and they are invisible owing to the smallness of their bulk. They move in the void (for there is a void); and by their coming together they effect coming into being; by their separation, passing away."

It is true that in this passage Melissos is not named, but the reference to him is quite unmistakable. He was the only Eleatic who made reality infinite, and this is distinctly mentioned here. We are therefore justified by the passage in explaining the genesis of Atomism and its relation to Eleaticism as follows. Zeno had shown that all pluralist systems yet known, and especially Pythagoreanism, were unable to stand before the arguments from infinite divisibility which he adduced Melissos had reiterated this, and had added, by way of *reductio ad absurdum*, that, if there were many things, each one of them must be such as the Eleatics held the One to be. To this Leukippos answers, "Why not?" He admitted the force of Zeno's arguments by setting a limit to divisibility, and to each of the atoms which he thus arrived at he ascribed all the predicates of the Eleatic One; for Parmenides had shown that if *it is*, it must have these predicates somehow. The same view is implied in a passage of Aristotle's *Physics*.[20] "Some," we are there told, "surrendered to both arguments; to the first, the argument that all things are one, if the word *is* is used in one sense only (*Parmenides*), by affirming the reality of what is not; to the second, that based on dichotomy (*Zeno*), by introducing indivisible magnitudes."

Atoms.

150. We must observe that the atom is not mathematically indivisible, for it has magnitude; it is, however, physically indivisible, because, like the One of Parmenides, it contains in it no empty space.[21] Each atom has extension, and is not, as in some modern theories,[22] reduced to a mathematical point, which is a centre of force. Matter and energy were still undistinguished; body was the form in which both were imagined, and the history of physical theories as to the constitution of the sensible world is little more than an account of the way in which energy gradually took its place alongside of matter as an equally real thing, tending more and more to replace it altogether.

All the atoms were exactly alike in quality,[23] and therefore all differences in things must be accounted for either by the shape of the atoms or by their arrangement. It is not quite certain whether the three ways in which differences arise, namely, shape, position, and arrangement,[24] were already clearly distinguished by Leukippos, or whether they belong rather to the later elaboration of the theory by Demokritos. It seems most likely that these more precise determinations of the doctrine were rendered necessary by the epistemological difficulties which Protagoras raised explicitly for the first time, and they therefore fall outside the scope of the present work.[25]

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[20] *Phys.* A, 3. 187*a*, 1 (R. P. 105*c*).

[21] The Epicureans misunderstood or misrepresented this point. See Zeller, 778, *n.* 1 (Eng. trans. ii. 225, *n.* 2), and in general the doxographical tradition as to the Atomists has been seriously perverted by Epicurean ignorance of history. (*Dox.* p. 219.)

[22] Modern Atomism really dates from Dalton; that of Gassendi was ancient Atomism revived. On the whole subject, see Stallo, *The Concepts of Modern Physics*.

[23] *De Cœlo*, A, 7. 275*b*, 32, they have all one φύσις; *Phys.* Γ, 4. 203*a*, 34, that which is common to them all is simply *body*.

[24] For these see Arist. *Met.* A, 4. 985*b*, 13–22 (R. P. 147). Theophr. *Phys. Op.* fr. 8 (R. P. 148 B).

The void.

151. Leukippos affirmed the existence both of the Full and the Empty, terms which he doubtless borrowed from Melissos.[26] As we have seen, he had to assume the existence of empty space in order to make his explanation of the nature of body possible. Space had been denied by the Eleatics on the ground that it was not corporeal, and therefore could not exist (§ 72). The Pythagoreans had, indeed, asserted its reality, but they had not been able to grasp the idea of abstract space, of an absolute void; they identified it with the unlimited Air (§ 119). Leukippos was the first to reach clear views on the subject. He admitted, indeed, that space was not real, that is to say, corporeal; but he maintained that it existed all the same. He hardly, it is true, had words to express his discovery in; for the verb "to be" had hitherto been used by philosophers only of body. But he did his best to make his meaning clear by saying that "what is not" (in the old corporealist sense) "is" (in another sense) just as much as "what is." The void is as real as body.

It is a curious fact that the Atomists, who are commonly regarded as the great materialists of antiquity, were actually the first to say distinctly that a thing might be real without being a body.

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[25] Cf. *Introduction*, § I. *n.* 1.

[26] Arist. *Met.* A, 4. 985*b*, 4 (R. P. 147). Cf. Melissos, fr. 14.

Cosmology.

152. Most of the statements that have been handed down with regard to the cosmology of Leukippos are rendered useless by their confusion with the later views of Demokritos. There can be no doubt, however, that Theophrastos treated Leukippos separately, and Diels has noted some cases where quite different theories are attributed to the two philosophers.[27] Hippolytos[28] gives the following account of Leukippos' theory with regard to the origin of the worlds:—

> He says that the worlds arise when many bodies are collected together into the mighty void from the surrounding space and rush together. They come into collision, and those which are of similar shape and like form become entangled, and from their entanglement the heavenly bodies arise.

It was natural for Leukippos to revert once more to the old theory of "innumerable worlds," for there was nothing in his system to render it impossible. We may note, too, that his view as to the way in which these worlds come into being is based on that of Anaxagoras. But it is not safe to go further in the discussion of details; for these have been for the most part handed down in the form they assumed in the next generation.[29]

Greatness of Leukippos.

153. With the theory of Leukippos, our story should properly come to an end; for he answered the question that Thales had been the first to ask. He had discovered how body must be regarded if we consider it to be the ultimate reality. Or at least he had given the

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[27] See, for instance, Aet. iii. 3. 10 and 11, where Leukippos is credited with an explanation of thunder resembling the old Ionic one, while that of Demokritos is more intimately connected with the atomic theory.

[28] *Ref.* i. 12. 2.

[29] In particular, we must not ascribe to Leukippos the Demokritean explanation of the "secondary qualities of matter" as subjective impressions. That view depends on the Protagorean doctrine that "Man is the measure of all things."

most satisfactory account of the matter; for the system of Anaxagoras, though it equally took account of Zeno's criticisms, was wanting in that simplicity which forms the chief attraction of Atomism. But the full importance of the new view was not at once seen, and we must therefore turn now to the consideration of an attempt to maintain the older monistic theory in the face of it.

III. *Diogenes of Apollonia.*

Date. 154. After discussing the three great representatives of the Milesian School, Theophrastos[30] went on to say:—

> And Diogenes of Apollonia, too, who was almost the latest of those who gave themselves up to these studies, wrote most of his work in an eclectic fashion, agreeing in some points with Anaxagoras and in others with Leukippos. He, too, says that the primary substance of the universe is Air infinite and eternal, from which by condensation, rarefaction, and change of state, the form of everything else arises (R. P. 159*a*).

This passage shows that the Apolloniate was somewhat later in date than the statement in Diogenes[31] that he was contemporary with Anaxagoras would lead us to suppose, and the fact that he is satirised in the *Clouds* of Aristophanes points in the same direction.[32] Schleiermacher held, indeed, that Anaxagoras was younger than Diogenes, to whom he accordingly gave the priority as to those doctrines in which they agreed; but this can no longer be maintained. Diogenes was not an innovator who prepared the way for the Anaxagorean theory of Nous, but a reactionary who strove to restore the attribute of intelligence to the primary substance of the Milesian School. Of the life of Diogenes we know next to nothing. He was the son of Apollothemis, and came from Apollonia in Crete.[33] The Ionic dialect in which he wrote is no objection to this; it was the regular dialect for cosmological works.

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[30] I agree with Diels (*Leukippos und Diogenes von Apollonia*, *Rh. Mus.* xlii. 1 sqq.) in attributing this whole passage to Theophrastos. There seems to be very little to be said in favour of Natorp's view, that the words are merely those of Simplicius (*Diogenes von Apollonia*, *ib.* xli. 349 sqq.), and his reply to Diels (*Nochmals Diogenes und Leukippos*) adds nothing new to the argument.

[31] D. L. ix. 57 (R. P. 159). The statement of Antisthenes, that he had "heard" Anaximenes, is due to the common confusion. He was, doubtless, like Anaxagoras, "an associate of the philosophy of Anaximenes." Cf. Chap. VI. § 98.

[32] *Clouds*, 227 sqq., where Sokrates talks of "mixing his subtle thought with the kindred air," etc. The word ἰκμάς was used by Diogenes, Theophr. *De Sens.* 44: κωλύειν γὰρ τὴν ἰκμάδα τὸν νοῦν.

The fact that Diogenes was parodied in the *Clouds*, suggests that he had found his way to Athens; and we have the excellent authority of Demetrios Phalereus[34] for saying that the Athenians treated him in the usual way. He excited so great dislike as nearly to imperil his life.

Writings.

155. Simplicius affirms that Diogenes wrote several works, though he allows that only one survived till his own day, namely, the *Περὶ φύσεως*.[35] This statement is based upon references in the surviving work itself, and is not to be lightly rejected. In particular, it is very credible that he wrote a tract *Against the Sophists*, that is to say, the pluralist cosmologists of the day.[36] That he wrote a book called *The Nature of Man* is also probable. This would be a physiological or medical treatise, and perhaps the famous fragment about the veins comes from it.[37]

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[33] D. L. ix. 57 (R. P. 159 and 159*a*).

[4] Ap. D. L. ix. 57.

[35] *Phys.* 151, 24 D (R. P. 160*a*).

[36] Simplicius (*loc. cit.*) calls them φυσιολόγοι, but adds that Diogenes himself used the older term, σοφισταί.

[37] Quoted in a free manner by Arist. *Hist. An.* Γ, 2. 511*b*, 30 sqq.

The fragments.

156. The work of Diogenes seems to have been long preserved; practically all the fairly extensive fragments which we still have are derived from Simplicius. I give them as they are arranged by Schorn—

(1.) In beginning any discourse, it seems to me that one should make one's starting-point something undisputed, and one's expression simple and dignified. R. P. 160.

(2.) My view is, to sum it up briefly, that all things are differentiations of the same thing, and are the same thing. And this is obvious; for, if the things which are now in this world—earth, and water, and air and fire, and the other things which we see existing in this world—if any one of these things, I say, were different from any other, different, that is, by having a substance peculiar to itself; and if it were not the same thing that is often changed and differentiated, then things could not in any way mix with one another, nor could they do one another good or harm. Neither could a plant grow out of the earth, nor any plant or animal come into being unless things were composed in such a way as to be the same. But all these things arise from the same thing; they are differentiated and take different forms at different times, and return again to the same thing. R. P. 161.

(3.) But this, too, appears to me to be obvious, that it is both great, and mighty, and eternal, and undying, and of great knowledge. R. P. 162.

(4.) For it would not be possible for it to be divided as it is without intelligence, so as to keep the measures of all things, of winter and summer, of day and night, of rains and winds and fair weather. And any one who cares to reflect will find that everything else is disposed in the best possible manner. R. P. 163.

(5.) And, further, there are still the following great proofs. Men and all other animals live upon air by breathing it, and this is their soul and their intelligence, as will be clearly shown in this work; while, when this is taken away, they die, and their intelligence fails. R. P. 163.

(6.) And my view is, that that which has intelligence is what men call air, and that all things have their course steered by it, and that it has power over all things. For this very thing I hold to be a god,[38] and to reach everywhere, and to dispose everything, and to be in everything; and there is not anything which does not partake in it. Yet no single thing partakes in it just in the same way as another; but there are many modes both of air and of intelligence. For it undergoes many transformations, warmer and colder, drier and moister, more stable and in swifter motion, and it has many other differentiations in it, and an infinite number of colours and savours. And the soul of all living things is the same, namely, air warmer than that outside us and in which we are, but much colder than that near the sun. And this warmth is not alike in any two kinds of living creatures, nor, for the matter of that, in any two men; but it does not differ much, only so far as is compatible with their being alike. At the same time, it is not possible for any of the things which are differentiated to be exactly like one another till they all once more become the same.

Since, then, differentiation is multiform, living creatures are multiform and many, and they are like one another neither in appearance nor in intelligence, because of the multitude of differentiations. At the same time, they all live, and see, and hear by the same thing, and they all have their intelligence from the same source (R. P. 164).

(7.) And this itself is an eternal and undying body, but of those things[39] some come into being and some pass away.

The medical reaction.

157. We have had occasion to note more than once the growing influence of medicine upon philosophy.[40] It was far from being an entirely good influence; for while, as we have seen, all progress at this time was necessarily in the direction of pluralism, medical theorisers

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[38] The MSS. of Simplicius have ἔθος, not θεός; but I adopt Usener's certain correction printed in R. P. It is confirmed by the statement of Theophrastos, that the air within us is "a small portion of the god" (*De Sens.* 42), and by Philodemos (*Dox.* p. 536), where we read that Diogenes praises Homer, τὸν ἀέρα γὰρ αὐτὸν Δία νομίζειν φησίν, ἐπειδὴ πᾶν εἰδέναι τὸν Δία λέγει (cf. Cic. *N. D.* i. 12. 29).

[39] The MSS. of Simplicius have τῷ δέ, but surely the Aldine τῶν δέ is right.

[40] See above, Chap. V. *n.* 17; Chap. VI. § 106.

required, or thought they required, a monistic foundation for their systems. That the chief interest of Diogenes was a physiological one, is clear from his elaborate account of the veins, preserved by Aristotle.[41] It is noticeable, too, that one of his arguments for the underlying unity of all substances is that without this it would be impossible to understand how one thing could do good or harm to another (fr. 2). In fact, the writing of Diogenes is essentially of the same character as a good deal of the pseudo-Hippokratean literature,[42] and there is much to be said for the view that the writers of these curious tracts made use of him very much as they did of Anaxagoras and Herakleitos.[43]

158. Like Anaximenes, Diogenes regarded Air as the primary substance; but we see from his arguments that he lived at a time when other views had become prevalent. He speaks clearly of the four Empedoklean elements (fr. 2), and he is careful to attribute to Air the attributes of Nous as taught by Anaxagoras (fr. 4). The doxographical tradition as to his cosmological views is fairly preserved— **Cosmology.**

> Diogenes of Apollonia makes air the element, and holds that all things are in motion, and that there are innumerable worlds. And he describes the origin of the world thus. When the All moves and becomes rare in one place and dense in another, where the dense met together it formed a mass, and then the

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[41] See *n.* 37.

[42] On which see Ilberg, *Studia Pseudippocratea.*

[43] See Weygoldt, *Zu Diogenes von Apollonia*, in *Arch.* i. p. 161 sqq. Hippokrates himself represented just the opposite tendency to that of those writers. His great achievement was the separation of medicine from philosophy, a separation most beneficial to both (Celsus, i. pr.). This is why the Hippokratean corpus contains some works in which the "sophists" are denounced and others in which their writings are pillaged. To the latter class belong the *περὶ διαίτης* and the *περὶ φυσῶν*; to the former, especially the *περὶ ἀρχαίης ἰατρικῆς.*

other things arose in the same way, the lightest parts occupying the highest position and producing the sun. Plut. *Strom.* fr. 12 (R. P. 168 A).

Nothing arises from what is not nor passes away into what is not. The earth is round, poised in the middle, having received its shape through the revolution proceeding from the warm and its solidification from the cold. D. L. ix. 57 (R. P. 168 B).

The heavenly bodies were like pumice-stone. He thinks they are the breathing-holes of the world, and that they are red-hot. Aet. ii. 13. 5 (R. P. 168 D).

The sun was like pumice-stone, and into it the rays from the æther fix themselves. Aet. ii. 20. 10. The moon was a pumice-like conflagration. *Ib.* ii. 25. 10.

Along with the visible heavenly bodies revolve invisible stones, which for that very reason are nameless; but they often fall to earth and are extinguished like the stone star which fell down flaming at Aigospotamos. *Ib.* ii. 13. 9.

We have here nothing more than the old Ionian doctrine with a few additions from more recent sources. Rarefaction and condensation still hold their place in the explanation of the opposites, warm and cold, dry and moist, stable and mobile (fr. 6). The differentiations into opposites which Air may undergo are, as Anaxagoras had taught, infinite in number (fr. 6); but all may be reduced to the primary opposition of rare and dense. We may gather, too, from Censorinus[44] that Diogenes did not, like Anaximenes, speak of earth and water as arising from Air by condensation, but rather of blood, flesh, and bones. In this he followed Anaxagoras (§ 106), as it was natural that he should. That portion of Air, on the other hand, which was rarefied became fiery, and produced the sun and heavenly bodies. The circular motion of the world is due to the intelligence of the Air, as is also the division of all things into

[44] *De die natali*, 6. 1 (*Dox.* p. 190).

different forms of body and the observance of the "measures" by these forms.[45]

Like Anaximander (§ 19), Diogenes regarded the sea as the remainder of the original moist state, which had been partially evaporated by the sun, so as to separate out the remaining earth.[46] The earth itself is round, that is to say, it is a disc: for the language of the doxographers does not point to the spherical form.[47] Its solidification by the cold is due to the fact that cold is a form of condensation.

Diogenes did not hold with the earlier cosmologists that the heavenly bodies were made of air or fire, nor yet with Anaxagoras, that they were stones. They were, he said, pumice-like, a view which seems to be an attempt to reconcile the other two. They were earthy, indeed, but not solid, and the celestial fire permeated their pores. And this explains why we do not see the dark bodies which, in common with Anaxagoras, he held to revolve along with the stars. They really are solid stones, and therefore cannot be penetrated by the fire. It was one of these that fell into the Aigospotamos. Like Anaxagoras, Diogenes affirmed that the inclination of the world happened subsequently to the rise of animals from the earth.[48]

We are prepared to find that Diogenes held the doctrine of innumerable worlds; for it was the old Milesian belief, and had just been revived by Anaxagoras. He is mentioned with the rest in the *Placita*; and if Simplicius classes him and Anaximenes with Herakleitos as holding the Stoic doctrine of successive formations and destructions of a single world, he has merely been misled by the "accommodators."[49]

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[45] On the "measures" see Chap. III. § 59.

[46] Theophr. ap. *Alex. in Meteor.* B, 2. 355*a*, 21 (*Dox.* p. 494).

[47] D. L. ix. 57 (R. P. 168 B).

[48] Aet. ii. 8. 1 (R. P. 168 C).

Animals and plants.

158. Living creatures arose from the earth, doubtless under the influence of heat. Their souls, of course, were air, and their differences were due to the various degrees in which it was rarefied or condensed (fr. 6). The views of Diogenes as to generation, respiration, and the blood, belong to the history of medicine;[50] his theory of sensation, too, as it is described by Theophrastos,[51] need only be mentioned in passing. Briefly stated, it amounts to this, that all sensation is due to the action of air upon the brain and other organs, while pleasure is simply aeration of the blood. But the details of the theory can only be studied properly in connexion with the Hippokratean writings; for Diogenes does not really represent the old cosmological tradition, but a fresh development of reactionary philosophical views combined with an entirely new enthusiasm for detailed investigation and accumulation of facts.

IV. *Archelaos.*

Anaxagoreans.

159. The last of the early cosmologists was Archelaos of Athens, who was a disciple of Anaxagoras.[52] He is also said to have been the teacher of Sokrates, a statement by no means so improbable as is sometimes supposed.[53] There is no reason to doubt the tradition

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[49] Simpl. *Phys. f.* 257*v*. See Chap. I. *n*. 124.

[50] For these see Censorinus, quoted in *Dox.* p. 191.

[51] Theophr. *Sens.* 39 sqq. (*Dox.* p. 510 sqq.).

[52] D. L. ii. 16 (R. P. 169).

[53] On the question of Sokrates' relation to the cosmologists, see A. Chiapelli in *Arch.* iv. 369 sqq.

that Archelaos succeeded Anaxagoras in the school at Lampsakos.[54] We certainly hear a good deal about Anaxagoreans,[55] though their fame was soon obscured by the rise of the Sophists, as we call them.

Cosmolo

160. On the cosmology of Archelaos, Hippolytos[56] writes as follows:—

> Archelaos was by birth an Athenian, and the son of Apollodoros. He spoke of the mixture of matter in a similar way to Anaxagoras, and of the first principles likewise. He held, however, that there was a certain mixture immanent even in Nous. And he held that there were two efficient causes which were separated off[57] from one another, namely, the warm and the cold. The former was in motion, the latter at rest. When the water was liquefied it flowed to the centre, and there being burnt up it turned to earth and air, the latter of which was borne upwards, while the former took up its position below. These, then, are the reasons why the earth is at rest, and why it came into being. It lies in the centre, being practically no appreciable part of the universe. (But the air surrounds and rules over all things),[58] being produced by the burning of the fire, and from its original combustion comes the substance of the heavenly bodies. Of these the sun is the largest, and the moon second; the rest are of various sizes. He says that the heavens were inclined, and that then the sun made light upon the earth, made the air transparent, and the earth dry; for it was originally a pond, being high at the circumference and hollow in the centre. He adduces as a proof of this hollowness that the sun does not rise and set at the same time for all peoples, as it ought to do if the earth were level. As to animals, he says that when the earth was first being warmed in the lower part where the warm and the cold were mingled together, many living creatures appeared, and especially men, all having the

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[54] Euseb. *P. E.* x. 14, p. 504.

[55] Anaxagoreans are mentioned by Plato, *Krat.* 409 A, and often by the Aristotelian commentators.

[56] *Ref.* i. 9 (R. P. 171).

[57] Adopting the correction of Diels.

[58] Adopting Roeper's supplement.

same manner of life, and deriving their sustenance from the slime; they did not live long, and later on generation from one another began. And men were distinguished from the rest, and set up leaders, and laws, and arts, and cities, and so forth. And he says that Nous is implanted in all animals alike; for each of the animals, as well as man, makes use of Nous, but some quicker and some slower.

It is not necessary to say much with regard to this theory, which in many respects contrasts unfavourably with its predecessors. It is clear that, just as Diogenes had tried to introduce certain Anaxagorean ideas into the philosophy of Anaximenes, so Archelaos sought to bring Anaxagoreanism nearer to the old Ionic views by supplementing it with the opposition of warm and cold, rare and dense, and by stripping Nous of that simplicity which had marked it off from the other "things" in his master's system. For this reason, too, Nous was no longer regarded as the maker of the world.[59] It may be added that this twofold relation of Archelaos to his predecessors makes it very credible that, as Aetios tells us,[60] he believed in innumerable worlds; both Anaxagoras and the older Ionians upheld that doctrine.

Conclusion. 161. The cosmology of Archelaos, like that of Diogenes, has all the characteristics of the age to which it belonged — an age of reaction, eclecticism, and investigation of detail.[61] Hippon of Samos and Idaios of Himera represent nothing more than the feeling that philosophy had run into a blind alley, from which it could only escape by trying back. The Herakleiteans at Ephesos, impenetrably wrapped up as they were in their own system, did little but exaggerate its paradoxes and develop its more fanciful side.[62] It was not enough for Kratylos to say with Herakleitos (fr. 84) that you cannot step twice into the same river; you could not do so even once.[63] But in nothing was the total bankruptcy of the early cosmology so clearly shown as in the work of Gorgias, entitled *Substance or the Non-existent*, in which an absolute nihilism was set forth and based upon the Eleatic dialectic.[64] The fact is that philosophy, so long as it clung to its old presuppositions, had nothing more to say; for the answer of Leukippos to the question of Thales was really final. Fresh life must be given to the speculative impulse by the raising of new problems, those of knowledge and conduct, before any further progress was possible; and this was done by the "Sophists" and Sokrates. Then, in the hands of Demokritos and Plato, philosophy took a new form, and started on a fresh course of development.

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[59] Aet. i. 7. 14 (R. P. 170*a*).

[60] Aet. ii. 1. 3.

[61] Windelband, p. 176.

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[62] For an amusing picture of the Herakleiteans, see Plato, *Theait.* 179 E. The new interest in language, which the study of rhetoric had called into life, took with them the form of fantastic and arbitrary etymologising, such as is satirised in Plato's *Kratylos.*

[63] Arist. *Met.* Γ, 5. 1010*a*, 12. He refused even to speak, we are told, and simply pointed with his finger.

[64] Sext. *Math.* vii. 65 (R. P. 184).

NOTE ON THE SOURCES.

A.—PHILOSOPHERS.

Plato.

1. It is not often that Plato allows himself to dwell upon the history of philosophy as it was before the rise of ethical and epistemological inquiry; but when he does, his guidance is simply invaluable. His artistic gift and his power of entering into the thoughts of other men enabled him to describe the views of early philosophers in a thoroughly objective manner, and he never, except in a playful and ironical way, sought to read unthought-of meanings into the words of his predecessors. Of special value for our purpose are his contrast between Empedokles and Herakleitos (*Soph.* 242 D), and his account of the relation between Zeno and Parmenides (*Parm.* 128 A).

See Zeller, *Plato's Mittheilungen über frühere und gleichzeitige Philosophen* (*Arch.* v. 165 sqq.), and *Index*, *s.v.* Plato.

Aristotle.

2. As a rule, Aristotle's statements about early philosophers are far less historical than Plato's. Not that he failed to understand the facts, but he nearly always discusses them from the point of view of his own system. He is convinced that his own philosophy accomplishes what all previous philosophers had aimed at, and their systems are therefore regarded as "lisping" attempts to formulate it (*Met.* A, 10. 993*a*, 15). It is not difficult, however, to make allowance for this; and if we do so, the testimony of Aristotle is of the greatest possible value.

See Emminger, *Die Vorsokratischen Philosophen nach den Berichten des Aristoteles*, 1878. *Index*, *s.v.* Aristotle.

Stoics.

3. The Stoics, and especially Chrysippos, paid great attention to early philosophy, but their way of regarding it was simply an exaggeration of Aristotle's. They did not content themselves

with criticising their predecessors from their own point of view; they seem to have really believed that the early thinkers actually held views hardly distinguishable from theirs. The The word *συνοικειοῦν*, which Cicero renders by *accommodare* (Chap. III. *n.* 43), was used by Philodemos to denote this method of interpretation. See *Index*, *s.v.* Stoics.

Skeptics.

4. The same remarks apply *mutatis mutandis* to the Skeptics. The interest of such a writer as Sextus Empiricus in early philosophy is to show that skepticism went back to an early date, as far as Xenophanes, in fact. But what he tells us is often of value; for he frequently quotes early views as to knowledge and sensation in support of his thesis.

Neoplatonists.

5. Under this head we have chiefly to consider the commentators on Aristotle in so far as they are independent of the Theophrastean tradition. Their chief characteristic is what Simplicius calls *εὐγνωμοσύνη*, that is, a liberal spirit of interpretation, which makes all early philosophers agree with one another in upholding the doctrine of a Sensible and an Intelligible World.

B.—DOXOGRAPHERS.

The "Doxographi græci."

6. The *Doxographi græci* of Professor Hermann Diels has thrown an entirely new light upon the filiation of the later sources; and we can only estimate justly the value of statements derived from these if we bear constantly in mind the results of this investigation. Here it will only be possible to give an outline which may help the reader to find his way in the *Doxographi græci* itself.

The "Opinions" of Theophrastos.

7. By the term *doxographers* we understand all those writers who relate the opinions of the Greek philosophers, and who derive their material, directly or indirectly, from the great work of Theophrastos, *Φυσικῶν δοξῶν ιη'* (D. L. v. 46). Of this work, one considerable chapter, that entitled *Περὶ αἰσθήσεων*, has been preserved (*Dox.* pp. 499–527). And Usener, following Brandis, further showed that there were important fragments of it contained in the commentary of Simplicius (sixth

cent. A.D.) on the First Book of Aristotle's Φυσικὴ ἀκρόασις (Usener, *Analecta Theophrastea*, p. 25 sqq.). These extracts Simplicius seems to have borrowed in turn from Alexander of Aphrodisias (*c.* 200 A.D.); cf. *Dox.* p. 112 sqq. We thus possess a very considerable portion of the First Book, which dealt with the ἀρχαί, as well as practically the whole of the last Book.

From these remains it clearly appears that the method of Theophrastos was to discuss in separate books the leading topics which had engaged the attention of philosophers from Thales to Plato. The chronological order was not observed; the philosophers were grouped according to the affinity of their doctrine, the differences between those who appeared to agree most closely being carefully noted. The First Book, however, was in some degree exceptional; for in it the order was that of the successive schools, and short historical and chronological notices were inserted.

Doxographers.

8. A work of this kind was, of course, a godsend to the epitomators and compilers of handbooks, who flourished more and more as the Greek genius declined. These either followed Theophrastos in arranging the subject-matter under heads, or else they broke up his work, and rearranged his statements under the names of the various philosophers to whom they applied. This latter class form the natural transition between the doxographers proper and the biographers, so I have ventured to distinguish them by the name of *biographical doxographers*.

I. Doxographers Proper.

The "Placita" and Stobaios.

9. These are now represented by two works, viz. the *Placita Philosophorum*, included among the writings ascribed to Plutarch, and the *Eclogæ Physicæ* of John Stobaios (*c.* 470 A.D.). The latter originally formed one work with the *Florilegium* of the same author, and contains, with a good deal of other matter, a transcript of some epitome substantially identical with the pseudo-Plutarchean *Placita*. It is, however, demonstrable that neither the *Placita* nor the *Eclogæ* is the original of the other. The latter is usually the fuller of the two, and yet the former must be earlier; for it was used by Athenagoras for his defence of the Christians in 177 A.D. (*Dox.* p. 4). It was also the

source of the notices in Eusebios and Cyril, and of the *History of Philosophy* ascribed to Galen. From these writers many important corrections of the text have been derived (*Dox.* p. 5 sqq.).

Another writer who made use of the *Placita* is Achilles (*not* Achilles Tatius). Extracts from his Εἰσαγωγή to the *Phænomena* of Aratos are included in the *Uranologion* of Petavius, pp. 121–164. His date is uncertain, but probably he belongs to the third century A.D. (*Dox.* p. 18).

Aetios.

10. What, then, was the common source of the *Placita* and the *Eclogæ?* Diels has shown that Theodoret (*c.* 445 A.D) had access to it; for in some cases he gives a fuller form of statements made in these two works. Not only so, but he also names that source; for he refers us (*Gr. aff. cur.* iv. 31) to Ἀετίου τὴν περὶ ἀρεσκόντων συναγωγήν. Diels has, accordingly, printed the *Placita* in parallel columns with the relevant parts of the *Eclogæ*, under the title of *Aetii Placita.* The quotations from "Plutarch" by later writers, and the extracts of Theodoret from Aetios, are also given at the foot of each page.

The "Vetusta Placita."

11. Diels has shown further, however, that Aetios did not draw directly from Theophrastos, but from an intermediate epitome which he calls the *Vetusta Placita*, traces of which may be found in Cicero (*infra*, § 12) and in Censorinus (*De die natali*), who follows Varro. It is quite possible, by discounting the somewhat unintelligent additions which Aetios made from Epicurean and other sources, to form a pretty accurate table of the contents of the *Vetusta Placita* (*Dox.* p. 181 sqq.), and this gives us a fair idea of the arrangement of the original work by Theophrastos.

Cicero.

12. So far as what he tells us of the earliest Greek philosophy goes, Cicero must be classed with the doxographers, and not with the philosophers; for he gives us nothing but extracts at second or third hand from the work of Theophrastos. Two passages in his writings fall to be considered under this head, namely, *Lucullus* (*Acad.* ii.), 118, and *De Natura Deorum*, i. 25–41.

(*a*) *Doxography of the* Lucullus.—This contains a meagre and inaccurately-rendered summary of the various opinions held by philosophers with regard to the ἀρχή (*Dox.* p. 119 sqq.), and would be quite useless if it did not in one case enable us to verify the exact words of Theophrastos (Chap. I. *n.* 45). The doxography has come through the hands of Kleitomachos, who succeeded Karneades in the headship of the Academy (129 B.C.).

(*b*) *Doxography of the* De Natura Deorum.—A fresh light was thrown upon this important passage by the discovery at Herculaneum of a roll containing fragments of an Epicurean treatise, so like it as to be at once assumed as its original. This treatise was at first ascribed to Phaidros, on the ground of the reference in *Epp. ad Att.* xiii. 39. 2, but the real title, Φιλοδήμου περὶ εὐσεβείας, was afterwards restored (*Dox.* p. 530). Diels, however, has shown (*Dox.* p. 122 sqq.) that there is much to be said for the view that Cicero did not copy Philodemos, but that both drew from a common source (no doubt Phaidros, Περὶ θεῶν), which itself went back to a Stoic epitome of Theophrastos. The passage of Cicero and the relevant fragments of Philodemos are edited in parallel columns by Diels (*Dox.* p. 531 sqq.).

II. Biographical Doxographers.

Hippolytos. 13. Of the "biographical doxographies" the most important is Book I. of the *Refutation of all Heresies* by Hippolytos. This had long been known as the *Philosophoumena* of Origen; but the discovery of the remaining books, which were first published at Oxford in 1854, showed finally that it could not belong to him. It is drawn mainly from some good epitome of Theophrastos, in which the matter was already rearranged under the names of the various philosophers. We must note, however, that the sections dealing with Thales, Pythagoras, Herakleitos, and Empedokles come from an inferior source, some merely biographical compendium full of apocryphal anecdotes and doubtful statements.

The "Stromateis." 14. The fragments of the pseudo-Plutarchean *Stromateis*, quoted by Eusebios in his *Præparatio Evangelica*, come from a source similar to that of the best portions of the *Philosophoumena*. So far as we can judge, they differ chiefly in two points. In the first place, they are mostly taken from the earliest sections of the work, and therefore most of them deal with the primary substance, the heavenly bodies and the earth. In the second place, the language is a much less faithful transcript of the original.

"Diogenes Laertios."

15. The scrap-book which goes by the name of Diogenes Laertios (cf. Usener, *Epicurea*, p. 1 sqq.) contains large fragments of two distinct doxographies. One is of the merely biographical, anecdotic, and apophthegmatic kind used by Hippolytos in his first four chapters; the other is of a better class, more like the source of Hippolytos' remaining chapters.

Patristic doxographies.

16. Short doxographical summaries are to be found in Eusebios (*P. E.* x., xiv., xv.), Theodoret (*Gr. aff. cur.* ii. 9–11), Irenæus (*C. hær.* ii. 14), Arnobius (*Talia prodit adv. nat.* ii. 9), Augustine (*Civ. Dei*, viii. 2). These depend mainly upon the writers of "Successions," whom we shall have to consider in the next section.

C.—BIOGRAPHERS.

Successions.

17. The first to write a work entitled "Successions of the Philosophers" was Sotion (D. L. ii. 12; R. P. 4*a*), about 200 B.C. The arrangement of his work is explained in *Dox.* p. 147. It was epitomised by Herakleides Lembos. Other writers of Διαδοχαί were Antisthenes, Sosikrates, and Alexander. All these compositions were accompanied by a very meagre doxography, and made interesting by the addition of unauthentic apophthegms and apocryphal anecdotes.

Hermippos.

18. The peripatetic, Hermippos of Smyrna, known as Καλλιμάχειος (*c.* 200 B.C.), wrote several biographical works which are frequently quoted. The biographical details are very untrustworthy indeed, but sometimes bibliographical information is added, which doubtless rests upon the *Pinakes* of Kallimachos.

Satyros.

19. Another peripatetic, Satyros, the pupil of Aristarchos, wrote (*c.* 160 B.C.) "Lives of Famous Men." The same remarks apply to him as to Hermippos. His work was epitomised by Herakleides Lembos.

“Diogenes Laertios.”

20. The work which goes by the name of Laertios Diogenes is a mere patchwork of all earlier learning. It has not been digested or composed by any single mind at all. It is little more than a collection of extracts made at haphazard, probably by more than one successive possessor of the MS. But, of course, it contains much that is of the greatest value.

D.—CHRONOLOGISTS.

Eratosthenes and Apollodoros.

20. The founder of ancient chronology was Eratosthenes of Kyrene (275–194 B.C.); but his work was soon supplanted by the metrical version of Apollodoros (*c.* 140 B.C.), from which most of our information as to the dates of early philosophers is derived. See Diels' paper on the Χρονικά of Apollodoros in *Rhein. Mus.* xxxi.

The method adopted is as follows:—If the date of some striking event in a philosopher's life is known, that is taken as his “floruit” (*ἀκμή*), and he is assumed to have been forty years old at that date. In default of this, some historical era is taken as the “floruit.” Of these the chief are the archonship of Damasias, 585 B.C., the taking of Sardeis in 546 B.C., the accession of Polykrates in 532 B.C., and the foundation of Thourioi in 444 B.C. Further details will be easily found by reference to the *Index*, *s.v.* Apollodoros.

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